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DR. JACOBI'S WORKS

COLLECTED ESSAYS, ADDRESSES, SCIENTIFIC PAPERS AND MISCELLANEOUS WRITINGS

OF

A. JACOBI

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IN EIGHT VOLUMES

EDITED BY WILLIAM J. ROBINSON, M. D.

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MEDICAL ADDRESSES

BY

A. JACOBI, M.D., LL.D.

VOL. VI

EDITED BY WILLIAM J. ROBINSON, M.D.

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NON NOCERE

I UNDERSTOOD that the audience in the General Sessions, consisting of all classes both of medical men and the cultured lay public, was to be entertained with the discussion of subjects, if possible, intelligible to all. Happily, of these there are a great many; for, indeed, the most humane of all the arts is, at the same time, the most human. It is mainly, however, the great specialists in our science that always find topics which, because of their intimate connections with moral, political, and social questions, are interesting to every man and woman of education and culture.

I, Mr. President, am perhaps, not so fortunately situated; though I am interested in all of them, I cannot boast of great discoveries in chemistry, bacteriology, or such branches of medical science as are pre-eminently, and sometimes too exclusively, called exact by their adepts and experts. My home has not so much been in laboratories as on the teacher's platform, and in the sick chamber, the hospital, and the councils of my profession. My life-work has been directed by something like the dictum of Paracelsus, that "true art is not so much revealed by knowing as by acting." Thus I have the honor of addressing you from the stand-point of the practitioner, firmly believing that in medicine, as represented in this Congress, every special research contributed to the general stock of knowledge does not become humanitarian, sacred, aye, medical, before it can be made subservient either to the prevention or the cure of disease. That principle was uppermost in the minds of the framers of these international medical congresses. From that point of view they ordained that special researches should be communicated in their sections, and that all the latter should be held organically together, like the branches of

a tree, or the organs of a system, by the binding power of general meetings. If it were not for that, international special societies would fitly take the place of international medical congresses, and we should have twenty-one sciences in place of the one undivided and indivisible medicine.

It is for that reason that our main anxiety must be, under the heading of "Non nocere," that "nil detrimenti respublica capiat." The congresses must remain what they were intended to be, an assembly for scientific, though also for social, purposes, of delegates of great institutions and corporations, of the leaders in general medicine and in its specialties, and of medical men all over the globe whose interests are devoted to science, in their capacity either as teachers and contributors, or as faithful practitioners. All of you, however, who are leaders in the profession and its councils, may you never forget that, as soon as the scientific concerns cease to prevail over the social, as soon as thousands flock together for the enjoyment of entertainments, excursions, and festivities, only, or principally, just so soon will the soul escape out of this body medical, and its constituents will be severed. I trust that in all meetings wisdom and moderation will combine to the end contemplated by the founders of our congresses. Do not forget that these congresses are among the intellectual powers of the earth, and that we are responsible to the world for maintaining them in their integrity. From time to time we shall then have the elevating spectacle of thousands of medical men from all parts of the world, and speaking a dozen different languages, convene at the same call and for the same purpose, moved by the same instincts and interests, the great and the lowly, the old and the young, brethren on the same moral and scientific platform, if not of equality, still of fraternity and solidarity.

Still, I set out to speak from the stand-point of the practitioner. The critical physician of the last decade or two has seen wondrous changes. His numbers may have increased somewhat, absolutely, but they have decreased, relatively. In large cities the thorough, all-

around, general practitioner is becoming scarce. Now and then he is expected to be but the city directory, or the agent for the specialists in brain and nerves, in kidneys and appurtenances, in uterus and appendages, in skin and corns, in heart and lungs, in stomach, throat, nose, eyes, ears, and what not. It will be very difficult to stem the current, for, indeed, the evolution of specialties, both in science and practice, is spontaneous and legitimate. But the waters left their bed long ago. The tendency of the time is mercenary, the medical man is still a man and but human, and many a one is very, very young, and expects to make a great reputation and an easy living out of very little mental capital, and out of a little manual dexterity, to the neglect of general medicine. "Ein Theilchen hat er in der Hand, fehlt leider nur das geistige Band." He forgets, or never knew, that the great specialistic work is performed by men possessing extensive general knowledge and previous practical teaching. He does not know or feel that with limiting his knowledge, and running after riches and reputation, he has already encroached upon his morals, and lowered the dignity of himself and of the profession. A young medical man who runs off into a specialty, honestly believing that a human organ can be studied and treated separately, like the wheel of a watch, has not intellect enough to be a physician, and ought to have been discouraged from entering the ranks. He who undertakes it from mercenary motives ought to be frowned down, and told that his tendencies and faculties belong to the places where they sell their wares and souls for lucre, and call it business, not a sacred vocation. You know it is but too true that, while science has taken wings and basked in the brilliant sunshine of rapidly increasing knowledge, the status and the tone of the profession have reason to despond over its restraining clogs. You, who are teachers and leaders in medicine, cannot alter the universal signature of the century; but what you can do is by your teaching to prove the absolute and indestructible dependence upon each other of each organ and the organism, and the logical impossibility of intelligently and scientifically treating a special organ without

a closer acquaintance with the body than is obtainable by a four-years' study of medicine and a three-months' special instruction by a teacher who is no better than his pupil. Many a young man sins because he knows no better, and was not told. If the teachers of medicine, if the great professors of specialties in the schools of learning, neglect the duty of teaching from their platforms the morals as well as the science and art of medicine, it is they from whom comes the harm. Moreover, the medical practitioners, by favoring, as they in their modesty are apt to do, in every possible case, the specialist, and the very existence of the specialists in large numbers and beyond need, have tempted the public into thinking less of medicine and medical men, and more of mere handicraft. That is why the physician has gradually lost his dignified position in large communities. It is in the country, where he still is, in his own person, the sole representative both of his science and his calling, that he is still esteemed at his full value.

This, however, is not the only way in which the medical men of every country have injured themselves and their calling. As they have overloaded their ships with the maintenance of uncalled-for numbers of self-made specialists, so they have submitted to the invasion of their lines by the manufacturer of drugs and artificial foods. If the countries be overrun with proprietary and quack medicines and foods, it is to a great extent the fault of the doctors, even those highest in rank. They will accept and praise, and certify to, the merchandises of the venders—I am afraid some of you carry them in your own pockets this moment—open and strengthen the market for them, and thus educate their public into attending and drugging themselves. If there is to be a pharmaceutical gospel, it ought to be for all of us the national Pharmacopœias.

Still another harm comes to the profession from its own members. Through anxiety to do good, and through prematurely jumping at conclusions from a newly discovered fact, we are liable to promise too much, and inadvertently run after fads. *Quod cupimus et credimus*

libenter. We promise to extinguish tuberculosis and to cure cholera. The phantasm disappears, and what remains is sneer and ridicule. We pretend to exterminate senility, and those who have to dig graves laugh at us for our pains.

The origin and source of all such harmful mistakes lie in the conscious or unconscious tendency to help and to heal, and in the fact that the practical perfectibility of all medical sciences depends on the good they can do. The greediness with which the modern products of organic chemistry are sought for in the markets of the world by anxious physicians, the great many errors committed in administering injurious doses which—I will only refer to the modern antipyretics with their after-effects, debility, collapse, lividity, cyanosis, depression, subnormal temperature, urticaria, salivation, hyperidrosis, etc.—find their explanation in the numberless cases of aches and woes requiring mitigation. But they also lead to the reproach, which is as old as medical practice, that the doctor is killing his patient, not only as Dryden says of the apothecaries in behalf of the warring doctors of London:

> "From random files a recipe they take
> And many deaths with *one* prescription make,"

but with the large number of his medicines and mediæval theriacs.

We all agree not only that over-dosing is wrong and harmful, but also that it is being practised. To give mercury to salivation; salines until the rest of soluble albumin and salts is gone; digitalis until heart and pulse are below danger line; belladonna until the throat is as hard as a gridiron; quinine until you get deaf; iron until gastric catarrh and constipation destroy what is left of health; to burn noses for everything in the line of ailment that may befall the flesh; to cut the cervix uteri for sterility and endometritis; to sew up the cervix uteri for sterility and endometritis; to cauterize and otherwise handle the problematic ulcerations of the uterus for sterility and endometritis, are abominations to the minds

of well-meaning physicians. Still they are being done, and will continue to be done until knowledge increases, judgment improves, the mercenary spirit disappears from our ranks, and perhaps the public refuses to submit. *Non noceatis.*

But if over-dosing and over-operating be wrong, and sometimes criminal, is it less wrong to under-dose and under-operate? Indeed that is done, I am sorry to say, to at least as dangerous degree. If you were to stand by a child's bedside strangled by a diphtheritic laryngitis, without resorting to intubation or tracheotomy, would you be made less culpable by relying on some theory of your own?

It is not enough to avoid legal responsibility, the civil law is mostly on your side—our law-book is the history of our art and the dictates of our heart. Both say that the so-called expectant treatment has done, and is daily doing, more harm than over-dosing. Our sins are those of omission as well as of commission. A whooping-cough leading to broncho-pnuemonia, pulmonary hemorrhage, or convulsion in the fifth or sixth week, while it might have been mitigated or checked before, is an arraignment of the doctor. The self-limited eruptive fevers, measles, scarlatina, typhoid, each of them liable to lead to myocardial changes, heart failure, and death, or to mental disturbance, which were not actively treated in time by absolute rest, reduction of heat, and moderate or vigorous early stimulation; the pneumonia which, when delirium, cyanosis, and dilatation of the right heart became urgent dangers, was not relieved by a venesection; the protracted and hesitating convalescence, with its anæmia and flagging pulse, which was not supported by heart tonics, not "pro re nata," for res was "nata" already, before it was too late forever, are, and must be for life, loads on the practitioner's conscience. Sophocles says (Aias 581):

> οὐ πρὸς ἰατροῦ σοθοῦ
> θρηνεῖν ἐπῳδὰς πρὸς τομῶντι πήματι.

"No bright physician mourns plaintively over a case where he ought at once to use the knife." Decision must

not be difficult, in spite of Hippocrates (ἡ κρίσις χαλεπή) for ὁ καιρὸς ὀξύς, the favorable time is fleeting. Nor hover over official "maximum doses" in cases where one of the scales contains your anxiety for your own personal safety and lawful righteousness, and the life of a human being is held in the other. Indeed, the maximum doses of the Pharmacopœias often appear to be established for the still less than average person who fears more for himself than for his patient.

Parallel to over- and under-dosing run over- and under-feeding. The latter requires no discussion here, the former I shall refer to only in connection with small infants, for the subject could not be exhausted in ten lectures. They require much food because they have not only to reproduce, but to grow. When they take beyond need, one of two things must occur; for no surplus can pass the alimentary tract any length of time without evil results. Either a surplus material is gradually accumulated in the organs and will lead to disease, or no complete digestion takes place, and then all forms of gastritis, enteritis, or auto-infection will develop. I shall only dwell upon two articles which have taken an improper hold on the imagination of medical men, and have almost been raised into subjects of superstitious veneration. The use of milk-sugar in place of cane-sugar in children's food, to any extent beyond what there is in cow's milk, or its exclusive employment, is a source of acid gastric catarrh which afterwards requires medicinal correction; it is transformed into lactic acid beyond need, and proves a detriment to the full conviction of all those who will give the subject proper attention. Thoughtful experience is as valuable an objective addition to our knowledge as a mere chemical or physiological theory.

Next in order is sterilized cow's milk, on which hundreds of thousands of babies are now being fed to the exclusion of everything else. Nobody would teach nowadays the feeding on unchanged or unmixed cow's milk to babies as a proper course to take—as a substitute for mother's milk. But sterilized milk has been looked up to as an object of faith, and treated as a pope among

foods, infallible. To feed babies exclusively on sterilized milk has become the rage since it was recommended by gentlemen of the highest possible standing in science, but, as far as I know, little conversant with the art of treating well and sick infants. I speak so bluntly because I love babies, one and all. Sterilized milk—pasteurized is inferior to it—is superior to unchanged cow's milk, but it is cow's milk still, and not human. Of seven cases, observed this winter, of infant scurvy—a nutritive disorder as far as we can make out—there were three that had been fed, two *exclusively,* one for several months, on sterilized cow's milk.

Mr. President, from the consideration of dangers incurred by the profession through its own fault, I gradually glided into the discussion of injuries inflicted upon the well or sick. That was my main object, and I shall now continue to do so. But you will bear with me when I say just here that what I can bring must be examples only. No book could ever exhaust the subject. These examples will be taken from infant life exclusively. What I meant to discuss before you, will be the three following subjects:

1. A temporary arrest of development, under the heading of *congenital constipation,* and its injurious treatment.

2. The harm done by *certain modes of local treatment in diphtheria,* and on sins of omission in its management.

3. The uselessness and *harmfulness of operative interference with idiocy and with microcephalus.*

These few I selected for your consideration, premising at once that, after having claimed that science finds its highest glory, aye, its apotheosis, in serving mankind, so my address shall try to convey some useful lesson.

Part of the dangers I propose to discuss are congenital, and either of fœtal origin or acquired during birth.

The path of the newborn is replete with dangers. Bright sunlight beams over ocean and shore after a perilous hurricane, and may meet either a happy landscape or wrecks of ship and man. So the upheaval in a woman's life, with its wonders and terrors, may terminate

either in unequivocal felicity or in continued danger. Such a one is the asphyxia of the newly-born, either brief or long; so much the graver the longer; that which occurs after head-presentation, or dates from intra-uterine inspiration, or depends on protracted pelvic pressure, or is complicated with injury done by forceps or with a spontaneous or traumatic internal kephalhæmatoma, is the worst in its results. Langdon Down elicited the history of forceps application in three per cent. of his idiots; Mitchell details the cases of 494 idiots, 57 of whom had a history of birth after a labor of more than thirty-six hours, 22 that of forceps, 29 of asphyxia. In a large number of cases, four or six every year, of idiots presented at the policlinic of the College of Physicians and Surgeons in New York and elsewhere, after having exhausted every other source of idiocy or mental hebetude, often complicated with peripherous physical symptoms, I am forced back to the probable diagnosis of asphyxia, which then is corroborated by the history of the case. Thus it is that the responsibility of the obstetrician is a very grave one. The future mental welfare of a newborn may depend on a few seconds more or less of the asphyctic condition. He must allow nothing to interfere between him and the asphyctic baby; not even I should say, a maternal hemorrhage. But now, while he is trying to relieve suspended animation, let him do no harm. There are good methods of resuscitation, some of them very good, provided the tongue is kept well forward. What I am anxious about is to warn against what I have often seen resorted to, the forcible inflation of the lungs through a catheter introduced into the larynx. Though this lies high and appears very accessible, the operation is not always quickly done, time is lost, and the attempt at regaining it has resulted in interstitial emphysema and tearing of lung-tissue, to my own knowledge. Air in the pericardium and pneumothorax have been reported. What I am still more afraid of than these accidents is the abuse of the electrical current. Babies will be saved by it, babies will die of it. The interrupted current, to produce satisfactory inspiration, must act a mere

second only. While one electrode remains stationary the other must be applied, for a single instant only, as many times a minute as you mean to have respirations. To leave the current at work for a longer time means over-stimulation and sudden death in the asphyctic newborn, as it does, in later life, in the (fortunately rare) cases of diphtheritic paralysis of the respiratory muscles.

Omitting, for the time is short, daily dangers produced by, and leading to, frequent grave mistakes—among them I think of septic infection through maternal secretions; through aspiration of decomposed liquor amnii; through the umbilical stump and fungi; through abrasions of the skin by forceps; by the hands of the obstetrician or the nurse; by hot bathing; by bursting pemphigus; through the eroded or gangrenous mucous membrane of the mouth and alveolar processes, produced by violent procedures of washing; through external wounds such as circumcision; through dressings, sponges, and scissors—omitting also to speak of the immediate dangers of the narrowness of the nasal channels, depending either on congenital contraction or on early catarrh with all its varied consequences—I now turn, Mr. President, to a subject in which I always was greatly interested for its practical importance, and beg of you first to listen to a tale.

A generation ago I had under my care a newborn baby who began to vomit the day after birth, and discharged no meconium. There was an anus and a rectum, which were freely and often injected during the course of several days, with no effect. The vomiting continued, tympanites set in, meconium was brought up, the abdominal veins became dilated, there was fever. Littré's operation was performed, the colon found and incised, and the baby died of peritonitis some days after. The autopsy revealed the following condition:

Below the point of incision lay the colon, turned three times upon itself; three flexures covered each other in such a manner that the subjacent one was always about one-half inch longer than the one above it; the lowest of the three was crowded down into the pelvis, entirely

compressed and contracted, and contained nothing but a little hardened mucus. The middle flexure contained the same mucus, and no meconium. The upper one was filled with meconium as far as the contracted lumen of the bowel would allow, and its outer left portion was the only one which seemed dilated (before the operation) by gas, and by the meconium crowding down from above. The inferior flexure reached beyond the median line, stretched upward to near the spina anterior superior of the right side, and from there the intestine turned back in an acute angle into the pelvic cavity, doubled upon itself, reached the median line on the right of the empty bladder, and terminated as rectum in its normal place. The distance from the point of incision in the left hypogastrium to the anus amounted to thirty-five centimetres. The ascending colon was of normal length. The transverse colon was not in its normal position, but stretched out directly to the left spina anterior superior, diagonally, in almost a straight line, formed an acute angle with the upper curvature described before, and gave rise to the pouch I found dilated before and during the operation.

Thus, there was a mechanical obstruction, brought about by the abnormally long descending colon, a condition upon which I look as an arrest of development, inasmuch as its relation to the length of the ascending and traverse colon agrees with their fœtal condition in the last part of utero-gestation. By the diagonal situation of the traverse colon, which formed an acute angle with what ought to have been the descending colon; by the mutual compression of the bowels; by its own numerous flexures; by the narrowness of the pelvis of the newborn, which became still more marked by the filling up of the bladder; by the infant's crying, which crowded the thoracic and abdominal contents down upon the intestines; and by the tract filling up with food, fæces, air, and gas, a virtual imperforation of the gut was accomplished.

A brief time after, in the practice of a colleague, there occurred a similar case. A full-term child, no rectal discharge, vomiting, examination with finger and bougie,

frequent injections of as large quantities of warm water as the gut would hold, the proposal of Littré's operation, which was refused, and finally, toward the end of the third day, meconium *per vias naturales*. I have seen more such cases since, but never made the same mistakes, for gradually I learned that my mishaps resulted from my ignorance of the fact that what appeared to me extraordinary was indeed but an excessive degree of a more or less normal condition. The ascending colon, after having been formed about the middle of utero-gestation, is quite short in the newborn; so is the tranverse colon. As, however, the whole length of the colon is considerable, indeed equals three times the length of the mature fœtus, the surplus must be found in the descending colon, and mainly in the sigmoid flexure. This occurs in 25 out of 100 cases of newborn children. It is found similarly to what I described in my unfortunate case, bent upon itself in several flexures, crowded out of the narrow pelvis, and frequently, in more than twenty-five per cent. of all the cases, extending beyond the median line of the body, not as an anomaly (according to Cruveilhier and Sappey), not in the majority of cases, as Hugnier claimed, who went so far as to operate for imperforate rectum on the right side of the pelvis; but in a sufficient number of cases; and as important enough to attract our attention for a different reason, viz.: A fair number of infants of normal size and weight, and fed on healthy breast-milk, suffer from constipation from the first day. There are those who never have a spontaneous discharge; those whose fæces form in hard, round balls of different sizes, unable to pass the sphincter; some who cannot be relieved except by mechanically emptying the rectum. Such cases I have seen by the hundred, and described as *congenital constipation*. It is easy to handle when understood. If we have learned what is the actual fact, that the normal relation of the different parts of the colon may be expected to establish itself toward the sixth or seventh year, we shall have patience. In most cases one or two daily enemata suffice to empty the gut. They must be continued year after year, until the normal end of the anomalous

condition will have been reached. Purgative drugs are rarely required—indeed, they are mostly contraindicated, and when given will do harm. They result in over-stimulation; and paralysis, with more costiveness, is a secondary result. I have seen, as the outgrowth of this congenital constipation, many instances of ulceration, of fetid diarrhœa, of septic auto-infection, of fevers sailing through months under the flag of malaria and continued fever. These are the cases in which the practitioner with knowledge enough, and sufficient intelligence and tact to individualize, will find the occasional indications to regulate the diet, to administer, in rare instances only, a purgative drug; to insist as a rule, however, upon the avoidance of medicines and the administration of regular enemata, and *non nocere.*

Allow me now, Mr. President, to pass to a subject which never appears trite, through its literature fill a library. I offer no apology for briefly considering what I consider harmful mistakes in the treatment of one of the most calamitous scourges of our race.

In diphtheria one of the dangers is suffocation. That can be easily recognized, and the indication for intubation or tracheotomy, repeated fumigations with ten or fifteen grains of calomel, and for steam, are readily found. The second great danger is from exhaustion and heart failure, which is not merely functional but organic. It is always to be feared, for we all know that apparently mild cases may thus perish. The indication, then, is to save and stimulate nerve strength by alcoholic beverages in large doses, and otherwise. The third great danger is sepsis, which is not to be feared to an equal degree in all cases, for diphtheria confined to the tonsils, with their large amount of fibrous tissues surrounding them, and with their scanty communication with the lymph system, is not liable to produce sepsis, and thereby to terminate fatally. The fourth great danger, in the worst forms of diphtheria, is the over officious and directly detrimental exertion of the attending physician in behalf of local treatment.

It is true, where the diphtheritic pseudo-membrane is

within reach, it ought to be either destroyed or disinfected. This is not the place to discuss the methods and the remedies. But we must never forget, first, that only a small part of the pharynx is directly accessible to such treatment, and that it is only one class of patients who can be subjected to it. In order to be effective the application must be thorough. None but adults or large children, and of them only a small number, will submit to opening their mouth and having applications made. It is that very class of patients only who can be induced to gargle with anything like success, though indeed, gargling will reach only the oral cavity down to the anterior pillars of the soft palate. Smaller children will object, will defend themselves, will struggle. It takes many a good minute to force open the mouth; meanwhile, the patient is in excitement, and perspiration, he screams, and fights, and exhausts his strength. You may, however, succeed in forcing the jaws; then begins the practice of making applications, of swabbing, of scratching off the pseudo-membrane, of cauterizing, of burning. The struggling child will prevent you from limiting your application to the diseased surface. You cannot help injuring the neighboring epithelium; thus, the process will spread; instead of doing good, you have done harm. No application, indeed, can do as much good as the struggling of the frightened child proves destructive. Even the intervals between the medical assaults are no period of rest to the tortured baby, whose fears result in constant mental and physical trepidation. I have seen them dying in defending themselves against the attempted violence, leaving doctor and nurse victorious on the battle field. It is incredible, but it is true, that more than one has recommended the use, after forcibly separating the jaws, of the electro-cautery or the thermo-cautery on the throat of the baby. It is incredible, for you are aware that the offenders cannot have been, or ought not to be, ignorant of the fact that what they can reach with their instruments is but very little besides the tonsil, and they might have known that the tonsils are not apt to favor the invasion of general sepsis. Why, then, in-

sist upon these cruel and brutal exertions, most of which are discovered and advised by men possessed of a schematic knowledge of a pathological process, which leads them to kill their patients while trying to destroy a bacillus? *le sujet est mort, mais il est mort guéri.* There is no excuse for them, for there are a great many ways in which an antiseptic treatment of the fauces can be carried out, by the frequent administration, both with internal and local effect, of mild doses of medicines, such as chloride of iron and bichloride of mercury.

Again I emphasize the fact, so often forgotten, that diphtheria, not to speak of the larynx, is mostly and almost exclusively dangerous when located in the nose and naso-pharynx. When the blood-vessels ooze slightly the toxine may be immediately absorbed into the blood, circumventing the lymph circulation altogether; or there are more perceptible diphtheritic membranes, either thin and macerating, or thick and obstructive, either odorless or fetid. The pseudo-membranes swarm with bacilli and toxin, with streptococci and staphylococci, and lead to immense tumefaction between the ears and clavicles, to the formation of multiple abscesses, to hemorrhages, to sepsis. All of these forms of nasal diphtheria require immediate, persistent, and efficient local treatment, for it is safe to say that every case of nasal diphtheria has a tendency to terminate fatally. Every procrastination is a death sentence. The local treatment is to consist in cleansing and disinfecting. In the bad cases, in which the nares are clogged with pseudo-membrane, the cleansing and disinfecting is to be preceded by forcing a passage though the nares with a probe covered with wadding and dipped in carbolic acid. Particularly is this indication urgent when there is sopor, which owes its origin partly to the difficulty of respiration, and partly to the septic condition. Again, I must abstain from alluding to methods and to remedies, for I proposed to say, not so much what is to be done, but what is to be avoided. Still, not to properly propose the proper thing is *nocere,* is committing a direct injury. Therefore, I will say briefly that in making local applications it is important that

they should be made often, every half, one, and two hours, and that the whole diseased surface should be touched. *Si duo faciunt idem non est idem.* Your personal supervision and interference is required, for one day, two days turn the scales. Ointments are not available in the average cases, where the whole naso-pharynx is the seat of the affection. The atomizer will seldom convey a sufficient amount of liquid into the cavities to be of much use. A spoon or small feeding-cup, the nozzle of which is narrow enough to enter the nose, will do fairly well, and will allow the introduction of liquids into the nares in small or large amounts, all of which will enter the throat, and be either swallowed or flow out of the mouth. The irrigator is liable by undue pressure, which cannot always be well measured, to injure the ear. It is true that this cannot take place very readily as long as the whole naso-pharynx is covered with pseudo-membrane, but this will not always remain, and then there is a possibility of the injection entering the middle ear. This will take place the more readily the younger the infant, because the pharyngeal orifice of the Eustachian tube is relatively larger and much more funnel-like in the very young than in advanced age. I prefer a small glass syringe with a conical nozzle of soft rubber. It will close up the nostril, the pressure can always be well measured and modified, and it is effective. The injections must be made in the recumbent or semi-recumbent position, frequently. On no condition must a child be taken out of bed for the purpose of having the nares washed or disinfected. I know of many cases in which the patient died thus through being taken up by either nurse or doctor. There you have at once grave sins both of omission and of commision. I follow it up with one of omission, which is just as bad, because it is just as fatal. As I have personally seen thousands of innocents die of diphtheria, thousands of them in the course of thirty-six laborious years, therefore, with trembling heart, I know whereof I speak; and still they are dying by the hundred thousand all over the globe, and that is why I preach my old sermons.

Non nocere. Do not harm, and permit no harm.

Cervical lymphadenitis resulting from nasal diphtheria, no matter whether it is the result of bacilli or equally septic and fatal streptococci, must be treated persistently and effectively. This treatment must be preventive and curative. The preventive treatment consists in the frequent nasal injections described above. They will reduce the immense tumefactions, partly glandular, partly peri-glandular, which extend often from ear to clavicle, within twelve hours. When large tumefaction has taken place, tincture of iodine and mercurial ointments are useless. Ice externally is rational, but it is useless as long as the infection is not stopped. I have, in a number of instances, injected iodoform, in ether, into the swelled mass. It is too painful and too inefficacious, and does not pay for the agitation, the anguish, and the exhaustion of the unhappy baby. So, indeed, there is no remedy besides the preventive measures, except in long and deep incisions into the immense mass. Do not wait for fluctuation, or even semi-fluctuation, for a great deal of the swelling is inside the fascia. Abscesses, when they form, are seldom large. The formidable swelling consists mainly of necrotic tissue, which ought to be laid open as soon as possible and disinfected. The incision must be a long and deep one—in most cases, from ear to clavicle. The disinfection of the wound may be obtained by subnitrate of bismuth, by tincture of iodine, and iodoform or other antiseptic gauze. No carbolic acid can be used for disinfection, because of its tendency to give rise to hemorrhages. When hemorrhage takes place, it is apt to stop under pressure with antiseptic gauze, but sometimes, large blood-vessels having been eroded, the hemorrhages are very copious. In such cases the actual cautery, acupressure, sometimes the ligature of blood-vessels, has to be resorted to. Avoid perchloride of iron and subsulphate of iron, for they give rise to a thick coagulated scab, under which septic absorption is apt to take place.

In connection with this subject of diphtheria, I may be permitted to allude to a remedy which, while having a healing and protecting effect in catarrhal conditions of the oral cavity, never had any right to be puffed up into

being a remedy for diphtheria. Large doses, however, have been recommended and given with the result that many years before I published (1876) cases of fatal poisoning by potassic chlorate in Gerhardt's "Handbuch der Kinderheilkunde," I had seen such cases in fair numbers. Both nephritis and methæmoglobinuria, as found by Marchand, were the effect of its administration. Numbers of such cases have been reported since, and still I have read but lately of the same big doses of the same poison praised in this very dread malady. Are we never to learn from our predecessors? Is our experience of so little consequence that its history counts for nothing and must not be consulted? Is diphtheria not dangerous enough by itself? and must it be punished by fatal doses of ours?

The last subject I dare to discuss before you is that of linear craniotomy, *craniotomie à lambeaux*, and circular craniotomy. The two former have been introduced by Lannelongue, who, in 1891, published twenty-five cases of "Enfants arriérés et jeunes sujets présentant, avec ou sans crises épileptiformes, des troubles moteurs ou psychiques." The results he claimed, not only as far as recovery from the operation was concerned, but also as to the improvements in mind which was said to have taken place in a remarkably short time, were so striking and novel that physicians began to hope, surgeons to glory—and the idiotic children? Let us see.

When the brains of operative surgeons were taken with the *furor operandi* on the brains of luckless children, the war-cry was: microcephalus and idiocy. By many the two were identified. Nothing henceforth was required but to open the heads in order to admit light. The literature on the subject having been quite extensive all over Europe, the American facts I intend to give you will require but a brief introduction.

Which are the underlying conditions of idiocy? I recall to your minds only the following records of autopsies and anatomical examinations both of the coarser or finer tissues: Chronic encephalitis (Jeanneret, Stark, Mierzejewski), either diffuse or circumscribed, frequently syphilitic; diffuse (syphilitic) disease of the blood-vessels

(Popoff); arrest of vascular developments in the cortex (Luys); inequality of the hemispheres; inequality of the peripherous cortical layer on the two sides; defect of the third frontal convolution and island of Reil; meningo-encephalitis with thickening and adhesion of pia and brain such as may occur after forceps or other trauma; kephalhæmatoma internum, spontaneous hemorrhages; embolism from heart disease; thrombosis from cholera infantum, followed by destruction of cerebral cells and atrophy cortex. This condition was found in 21 cases out of a total of 343 collected by Starr. He further reports: Maldevelopment and apparent atrophic condition of the brain-structure of the hemispheres, chiefly cortical, the cells resembling those of a newborn child, but with no apparent gross defects in the brain, 32 cases; atrophic or hyperplastic sclerosis, congenital or post-natal, 97 cases; atrophy by softening produced by embolism or thrombosis, and limited to certain arterial districts, 23; arrests of development such as porencephaly, 132 (frequently in a thin cranium); cysts which produced atrophy by pressure, or were associated with the atrophy to the original lesion, 14; hemorrhages which were discernible by the remains of a clot, or by the hæmatin staining of a cyst of the pia or of sclerotic tissue, 18.

Finally there is among the causes of idiocy hydrocephalus, microcephalus with or without micromyelus, or other changes in the spinal cord, mainly of the pyramidal tracts,[2] and lastly, premature ossification of the fontanelles and sutures.

Meningo-encephalitis in some form or other is very common. Here belongs one of Lannelongue's early cases

[2] This connection has often been observed (Aeby, Thiry, Flesch, Anton). In their slow evolution (Hervouet) from the fifth month of uterine life to the completion of the fourth year, many changes are liable to take place. The number of the cells of the anterior horns was found diminished by Hervouet, Steinlechner, Gretschischnikoff, Schottenberg. Other arrests of development are also frequent. Bourneville mentions phimosis, and patent foramen Botalli, ectopy of testicles, and hypospadias. The two latter I met with several times.

described by Bourneville. It was operated June 22, 1890, was kept in the hospital to February, 1891, was then carefully nursed and trained, but got no better, and finally died of broncho-pneumonia. What did the autopsy reveal? Pachy- and lepto-meningitis, normal sutures, wormian bodies between them, and a thin and transparent skull.

If we be told that the operation is made for microcephalus—indeed, many of the histories intrusted to me exhibit that diagnosis though but few measurements be given (in one of which the head had a circumference of 50 ctm. [20 inches])—what does it mean? Which are the causes of small-headedness? Is it always premature ossification? Very far from it; the copious literature of microcephalus proves the contrary. Taquet reports 26 skulls of idiots, none of them ossified. Bourneville demonstrated 12, all of them with persistent sutures, 3 even with pathological disconnections. With me it is the rule to see microcephalus with open sutures. While the anterior fontanelle need not be large, the sagittal sutures mainly, but also the others, are open and remain so for years—four, five years, and more. If, finally, the bones coalesce, let me ask the question, is there a sound man who can believe or hope that the linear or circular reopening of the skull will encourage brain growth which did not exist while the sutures were still patent?

Now, premature ossification, in our sense, does not mean absolute absence of the sutures, which is almost never seen. Vrolik's case of a boy of seven, and Cruveilhier's of a child of a year and a half, without any discernible sutures, are exceptional. Nor is it of any importance to know that, according to Huschke, the cranium does grow up to the sixtieth year, or that Pommerel puts synostosis between the forty-first and fifty-first year, or Sappey complete obliteration of the sutures beyond the eigthieth. What concerns us is to know that the rapid growth of the brain is impeded normally, if at all, by a virtual closure of the sutures about the fifteenth month of life, and that, according to the period of this closure, the intellect is

either but little or much impaired, or that the most serious motory, sensitive, and sensory disturbances are brought about by it. Between a slight impairment of mind and complete idiocy every possible degree and manifestation is met with. Virchow's old dictum, that cerebral functions may depend on size and symmetry of cranium and brain, still holds good. He never said there was no other cause of the disturbed cerebral equilibrium, and a recent writer who gloats over his own assertion that this teaching of Virchow's has been put to rest, lost his own equilibrium in his critical effort.

The nature of premature ossification can be best studied in such cases as exhibit that anomaly to a slight degree only, and symmetrically; namely, where the closure of the cranium takes place, say between the fifth and tenth months of life, instead of the fifteenth. There you have a solid capsule, with deep digital impressions, like those of an adult, and narrow or absent foramina emissaria. The dura mater is firmly attached, rather anæmic, unless a secondary morbid process resulted in hyperæmia; in the same condition is the substance of the brain; it is pale and dense; its convolutions are apt to be flattened, remain in that condition when the dura is cut or bulges out like an elastic mass; the ventricles are narrow and contain but little, if any, liquor. The brain when removed from the cranium is apt to remain hard, and slices of moderate thickness retain their consistency.

This condition of a relative hypertrophy of the brain, or rather, of a normal brain locked up in an abnormal skull, I have met with quite a number of times, before and since I published, in 1857 and 1849, my papers on the etiological and prognostic importance of the premature closure of the fontanelles and sutures of the infantile cranium. A similar case was published by Mauthner in 1857, in the *Oesterr. Zeitsch. f. Kinderheilk.;* but even some of the greatest pædiatrists, such as Rilliet and Barthez, had and have since overlooked the condition. It was only Bouchut who quoted a description of this condition in his manual. This class of children are apt to exhibit a good or fair intellect during their early lives. They

smile at the proper time, are robust and apparently healthy, but with that complication every morbid condition is liable to develop dangerous symptoms; a moderate broncho-pneumonia is apt to become complicated with convulsions, and may prove fatal; or, without any apparent complication, there will be slight symptoms of irritation, contractions of the extremities, clonic convulsions, sopor, death. Generally, there are no unilateral symptoms; where they occur, they are rather the result of a convulsion, followed by a local lesion, than of the original compression of the cerebral tissue. As I have met with such cases in large numbers, I always examine the heads of babies affected with any inflammatory or febrile disease. Simple cases, like the following, will be met with: A boy of eleven months was seen November 1, 1857, after having been quite well before. In brief intervals there was fever, vomiting, clonic convulsions, dilated pupils, and death on the sixth day. The head was of fair size, symmetrical. There were six teeth; the first had appeared in the upper jaw. The fontanelles were virtually closed three months previously.

Many cases are of this simple character, but many more are less hopeful. Paralysis, epilepsy, idiocy are met with in those whose crania were closed at birth or soon after, and every possible symptom of paralysis or irritation, unilateral or bilateral, may become visible. Besides, we must not imagine that premature ossification is always of the same character. It is true it depends on a local nutritive or inflammatory disorder of the bone; but it cannot always be known whether this process is localized or complicated. It may be independent of the brain. Zuckerkandl says so, and I know it. It may be complicated with similar affections of the brain, and with premature growth and development of the bones of the face and of the teeth and the rest of the body. Therefore it is that in many cases premature ossification is universal, and the teeth come early, and the upper teeth first. In others the teeth may come at the normal time, or even later, and the bones of the trunk and extremities may by no means be more advanced than normally; also the brain symptoms

may be of the most various kinds. Among my cases are the following: In Vanderveer's, the fontanelles closed at nine months; no vision, eyes roll, head not sustained, frequent convulsions, body well developed; idiocy. In Willy Meyer's, anæma, paralysis of the lower extremities, strabismus; idiocy. In Wyeth's, restlessness, "cataleptic attack," talipes varo equinus, mainly of the left side, left hand slightly flexed, spasms of the internal recti, pupils dilated, jerky movements of arms; idiocy. Now, what is the diagnosis of premature ossification?

The latest writer on the operative treament of microcephalus has the following to say in regard to diagnosis: "As changes of the cranium cannot be recognized with certainty, anamnestic points are of the greatest importance. Where the history excludes protracted and difficult labor, the application of forceps, the presence of asphyxia at birth, or cerebral affections and kephalhæmatoma after birth, the symptoms of traumatic epidemic, or endemic meningitis, or the local signs of diffuse or circumscribed encephalo-meningitis, or the motory or sensitive disturbances of porencephaly, all of which may result in deaf-mutism, blindness, paralysis, either general or local, or in local convulsions or contractions—where all these can be excluded, it is permissible to assume the presence of premature ossification, and to perform an operation."

Still many of these symptoms may occur in premature ossification also, the diagnosis of cerebral affections leaving still so much to desire; I know, however, we can do better in the direction of a diagnosis. What I have to propose in that line is old, I know, but for many I am certain it is new, for if it were not, many of the reckless operations on the helpless, unfortunate young ones would not have been performed. In this respect I totally disagree with my famous friend, M. Allen Starr, who asserts that it is at present impossible to determine absolutely the pathological condition present in any given case, without an exploratory operation.

In a great many cases I have succeeded in making the diagnosis with certainty. Some are unmistakable; they are those which were born with their sutures closed, and with

early cerebral symptoms of a general and bilateral nature. Still some difficulty may arise about those who are first presented when from one to three years old or older. Indeed there are some of the operative cases in my hands, three and four years old, which are supplied with the notice that the sutures were closed at that time. Indeed they should be, for the time of the normal obliteration is within the first half of the second year of life. Now there are but few parents but can answer the following questions: Was there ever a fontanelle? Was the head ever soft on top and pulsating? How old was the baby when he first smiled? When did he walk or attempt to walk? When did the first tooth come? Was it a lower or upper tooth? Are the teeth strong and healthy, or not? Are the right and left limbs equal in power? If there be twitching or rigor are they more visible on one side than on the other?

The replies to these questions make your diagnosis. The first appearance of teeth in the upper jaw is an almost constant symptom and characteristic (though irregular protrusion of teeth may occur in rachitis). Uncomplicated cases will also stand on their feet early. It appears that in many the whole osseous tissue ossifies at a nearly equal pace. The superior maxilla, however, appears to participate in this general process more than the rest. It is noticeable that these children with premature ossification are generally the first born.

The more irregular the cerebral symptoms, the more unilateral, or confined to one limb or a set of muscles, the greater is the probability of a complication of brain disease with premature ossification. In such cases of older children the history elicited must be positive as to the absence of a fontanelle in the first year.

What are the indications for the operation? Starr says when the condition is one of arrested development of cerebral tissue it may be of service. When the skull is markedly microcephalic from early union of sutures the increased space given to the brain by the operation appears to stimulate its growth and development. It may be performed where medical treatment is inefficient, in

hemiplegia, sensory defects, imbecility with or without epilepsy, aphasia, and athetosis. He is also of the opinion that if great caution and little time be used the dangers of the operation can be avoided. European operators go far beyond these indications. One claims to have transformed mania into quiet dementia—a change which is common enough without saw and chisel—by destroying fibres of association (Burkhardt); but while another operates for septic meningitis, recent hemorrhages, and headaches (Horsley), another restricts the surgical interference to abscess, trauma, and tumor (Bourneville).

Lannelongue's first report of 1891 comprised twenty-five cases of linear craniotomy with remarkable results; a great many improvements were said to have taken place in the twenty-four survivals. No such statistics have ever since been submitted; on the contrary, the mishaps of the surgeons of both hemispheres make them appear more fabulous than ever. But the brilliant example was not lost. It was about the time of the tuberculin excitement. Pulmonary tuberculosis and idiocy in all its forms could be eliminated from the surface of the globe by simple means—the millennium was coming.

I hold in my hand, Mr. President, the reports of cases operated upon for so-called idiocy, or for so-called microcephalus, by such American surgeons only as I could reach personally, so as to have their tales verified from their own lips. The cases I command are 3 of Dr. Charles McBurney, of New York, 2 of Dr. Willy Meyer, of New York, 8 of Dr. John A. Wyeth, of New York, 14 of Dr. W. W. Keen, of Philadelphia, 3 of Dr. Burney Sachs, operated upon by Dr. Arpad Gerster, of New York, and 2 of Dr. I. Vander Veer, of Albany, N. Y. On these 33 cases 41 operations were performed. Of 33 there were 14 deaths and 19 recoveries. The deaths did not occur in the very young ones alone, but also in those four, five and six years of age. Most of them occurred soon after the operation, six within a day. Cause of death is not always given or known; in one it was attributed to the anæsthetic, a number of them developed a very high temperature which was not explained, inasmuch as

Reported by	Patient.	Age.	Diagnosis and history.	Operation.	Results.
Charles McBurney.	M. H. (f.).....	12 yrs.....	Microceph. since birth. Mentally weak, petit mal, and convulsions.	Nov. 11, 1892.....	Petit mal not so frequent.
	Same	.....	.....	Dec. 19, 1892.....	Attacks as formerly. Feb. 20, 1894, Dr. Starr's report: much improved in many ways.
	W. L. (m.)....	6 yrs.....	Microceph. Deficient in mind, unruly, no intelligible speech.	Oct. 6, 1893.....	April 11th, no change. Feb. 20th, Mrs. Seguin thinks "improvement great and out of proportion to other not operated similar cases."
	F. M. (m.)....	7½ yrs.....	Well until 4 years of age. Convulsions, fever, right hemiplegia, aphasia, epilepsy.	March 27, 1893....	No improvement.
Willy Meyer	M. B. (f.).....	2 yrs.....	Microceph., oxyc., premature ossification, anæmia, paral. ext. inf., strabismus, idiotic expression. Forceps, strabismus, and insufficient motility of both lower extremities since birth, lately frequent convulsions, general and local (face), head retracted during sleep.	May 8, 1891. Linear craniotomy, little hemorrhage, 9 ctm. long, 2 ctm. wide.	Died May 11th, with high temperature (up to 106°), gritting teeth, sudden cries, and retraction of head.
	J. B. (m.).....	4 yrs.....	Tumor suspected.....	June 19, 1891. 12 ctm. long, 3 ctm. wide.	Died after four hours, increasing temperature.
John A. Wyeth....	B. S. (m.), N. J.	4 yrs.....	Skull 50 ctm., epileptic since 4 months, no speech, no hearing.	April 7, 1890.....	Died after twelve hours, shock.
	I. W. H., Ind..	11 m.....	Font. closed at 4 weeks, restless, "cataleptic attack at 8 months, after which tal. vaso-eq. mainly left, left hand slightly flexed, eyes conv. mov., pupils dilated, dull look, jerky movement of arms, cran. small, pointed."	Jan. 7, 1891. Two long trenches above eyes to occiput, tearing of bone from dura.	Sept., 1893, "triumphant letter" of mother. Jan. 31, 1894, "4 years, but 2 or more behind in mind," speaks a few words.

	R. R., Conn....	14 yrs.....	Infant small, delicate, sinking spells the first 2 and 3 weeks with cyanosis, fell at 2 years, 6 weeks after convulsive through 2 years, free 5 years, head small, epileptic.	Oct. 20, 1891.....	Temporarily improved; No improvement (letter of mother).
	F. H. G., Conn.	5 yrs.....	Microcephalic	Nov., 1891.....	Died after fourteen hours, shock.
	E. H. G., Me..	22 m.....	.....	Dec. 16, 1891.....	Died on the sixth day.
	J. O. (f.), N. Y	20 m.....	.....	March 21, 1892....	Died on the third day, portion of right par. bone removed.
	H. C. C., N. Y.	4½ yrs.....	.....	Jan. 4, 1893.....	No improvement.
	I. F. D., N. Y..	2 yrs.....	.....	Jan. 4, March 29, May 8, 1893. Portion of both par. and occ. bones near vertex removed.	"Feb. 14, 1894, splendid physique, after excitement jerking in sleep, recognition better, knows family, kicks when tied in chair, cannot stand without assistance, does not grasp or hold fast, less rolling eye, not much crying, left hand always closed, hears good, delighted with music."
W. W. Keen	M. E. (f.).....	4 yrs. 7 m..	.....	Nov. 19, 1890. Feb. 17, 1891.	Recovery. Moderate improvement.
	K. K. (f.).....	1 yr. 7 m...	.....	March 12, 1890, Feb. 3, 1891.	Recovery. Moderate improvement.
	I. L. H. (m.)..	1 yr. 4 m...	.....	Jan. 16, 1891.....	Died of sudden heart failure one and one-quarter hour after operation.
	E. S. (f.).....	3 yrs. 6 m.	.....	Nov. 7, 1891.....	Recovery. No improvement.
	L. F. (m.)....	2 yrs.....	.....	Oct. 14, 1891, March 16, 1892.	Recovery. No improvement, but slept quietly.
	G. F. C. (m.).	3 yrs. 2 m..	.....	Oct. 20, 1891.....	Died the same day.
	H. T. (f.).....	6 yrs. 6 m..	.....	May 29, 1891.....	Recovery. Slight improvement.
	P. I. (f.).....	6 yrs.....	.....	1891	Died after three hours.
	H. H. (f.).....	3 yrs. 6 m..	.....	Nov. 2, 1891.....	Recovery. No improvement.
	F. S. (f.).....	3 yrs. 2 m.	.....	March 15, 1893....	Recovery. Slight improvement.

Reported by	Patient.	Age	Diagnosis and history.	Operation.	Results.
	F. W. (f.)	1 yr.	.....	April 22, 1892.	Died after a week.
	H. T. M. (f.)	2 yrs. 6 m.	.....	April 27, 1893.	Died after thirty hours.
	M. D. (f.)	3 yrs. 3 m.	.....	May 29, 1893, June 22, 1893.	Recovery. No improvement, skull as thick as adult's.
	M. D. D. (f.)	.....	.....	Sept. 29, 1893.	Recovery. History unknown.
Burney Sachs	Female	4½ yrs.	Walked after 2 years, spoke a little in 2 years, two convulsions at 15 months, one at 29 months, more idiotic since, lost speech, irritable, unruly, sleepless. No fontanelles, circumference of head 31 ctm., nose to occipital prominence 30 ctm., binauric 32½ ctm.	Jan. 9, 1891.	Died suddenly in three and a half hours after rallying.
	Male	4 yrs.	Forceps and asphyxia, some convulsions between first and second year, teething late, walked after 3 years, drags left leg, no speech. Skull small in front 45 ctm., binaur. 28½ ctm., naso-occipital 27½ ctm., right.	Sept. 14, 1891, linear right under ether.	Laughed, stood up in bed, played as never before, otherwise no improvement.
	Same	.....	.....	Nov. 20, 1891, left, chloroform, more hemorrhage than in first operation.	Unconscious. Vomited much. Died eleven hours after operation. Autopsy: skull thick, dense bands of fibrous tissue under opening in skull, sutures obliterated, anterior lobes of both hemispheres very irregular in fissuration, convolutions half size.
	Female	5 yrs.	Four convulsions between 15 months and 3½ years, discharge of ear since third month but hearing fair, eyes normal, no intelligible speech, eats the floor, does not call for food or defecation.	Jan. 22, 1891. Trephine, chisel, rongeur, like previous operations.	Died that afternoon.

not even the dura was injured. Many died of shock a few hours after the operation.[3] The final report as to their mental and general condition was as follows: No history obtained, 1; uncertain, 1; no improvement, 7; slight improvement, 7; "some," 1; much improvement, 2.

Permit a few more words as to the results of the operation.

Dr. Vander Veer, of Albany, N. Y., reported the case of a girl two years of age. Forceps operation of four hours' duration resulted in extensive lesion of the scalp. Never developed mentally; had as many as twenty-five convulsions daily, with and without vomiting, after the age of three months. Operation October 14, 1893, on the left side of cranium, four and one-half inches long, extending to nearly the lambdoid suture, and one inch wide. Left hospital October 30th. Seventeen short days after that, November 15th, the family physician reports that since November 8th the child did not sleep well, and had returns of the nervous spells or partial convulsions; but before that, ten days after leaving the hospital, the child seemed brighter and took more notice of things around her.

The following case was also reported by Dr. Vander Veer:

Arthur McKee F——, born May 22, 1891. Previous to his birth a miscarriage at six weeks and a still-birth. Mother had albuminuria every time (syphilis?). Teething at nine months. Then the fontanelle was noticed to have closed. Examined July 1, 1892. No vision, eyes roll, head not sustained, body well developed. Convulsions frequent. Operation October 6, 1892, on left side from frontal to occipital bones, four inches long, one wide. November 2d appeared "more natural." Second operation May 19, 1893, on the right side. Examination

[3] According to Ackerman the causes of death after the performance of the operation, and depending thereon, were acute sepsis, loss of cerebro-spinal liquor, shock, collapse, fever, acute anæmia, and the anæsthetic employed during the operation. Altogether the deaths amounted to from fifteen to twenty per cent. of all the operations collected and discussed.

of the left side of the skull at this time did not give evidence of any great development of the brain, as there was rather a tendency for the dura to sink in than to rise above the surrounding portions of bone. November, 1893, more quiet, does not see, recognizes sound, moves arms and legs, and stands when supported.

Dr. John E. Wyeth reports a case which appears to be one of premature ossification with cerebral complications, though there be no exact measurements. The fontanelles are said to have closed when the child was four weeks old. The operation was performed when the child was eleven months old. January 7, 1891, two long trenches were dug from above the eyes to occipital bones, and joined posteriorly, the bone torn off from the dura and elevated so as to produce a fracture anteriorly. On September, 1893, a "triumphant letter" was received from the mother. On January 31, 1894, however, she writes that the child was now four years of age, but two or more behind in mind. It may be remembered that this is three years after the operation.

Léon Gallez says, in his "La Trépanation du Crâne," p. 417, 1893, of craniotomy that *elle procure le plus souvent une amélioration évidente.* That is an over-estimation. Personal knowledge of the facts he does not claim. Firstly, the mortality of the operations is very great. Secondly, a large number of cases are admitted not to have been benefited at all. Thirdly, when amelioration has been reported, what does it mostly amount to? It would be absurd, theoretically speaking, to deny the power of observation or the veracity of those who report; but who are they in most instances? In the majority of cases they are loving, hoping mothers. Who has not seen to what extent the idiotic child in a family—frequently the first born—is petted, made most of, admired, and how every ray of mental light is reflected from a magnifying mirror of adoring and anxious scrutiny. Besides, many of the reports are made soon after the operation, and therefore become rather valueless. Moreover, after the performance of that serious operation, made for a special purpose, attention and training are doubled; and progress

attained through assiduous training was never questioned even before the times of Edward Seguin. Finally, a difference of from one-half to two years amounts to a great deal in a child of one or two years of age, in the possibility of mental improvement.

A temporary relief, either entire or partial, of epilepsy, does not mean much, for any operation on any part of the body is apt to modify its course.

Altogether, the mortality and the insufficient results in those who survive have exerted a discouraging influence on my surgical friends. What here follows are the opinions of some of them as they were expressed but a short time ago.

In a letter dated June, 1892, when he had operated on twelve cases, Dr. Keen makes the following statement: "I would at present operate on cases under eight years of age, but not over, and in cases with sufficient physical vigor to make recovery probable. I would only operate on one side at a time, but make the incision as long as possible, from the forehead to the occipital bone, and possibly, or even probably, T-shaped by a vertical incision toward the ear. My results have been those of improvement in almost all the cases that survived; an improvement makes the operation worth doing. But do not promise too much intellectually or even physically."[4] In a letter I received from the doctor lately (1894) he says: "The mortality is very high, and in my experience the gain is moderate, but possibly worth the risk."

Dr. Wyeth formulated his experience for me on February 22, 1894, as follows: "My operations were eight.[5] There were three deaths, one dying of hemorrhage on the table, two of shock, of whom one after twelve hours, and one with temperatures of 104° and 105° F., on the fourth day. There are two varieties of microcephalus, one due to premature ossification and consequent compression; and one due intrinsically to deficient brain development. These can be made out by incision through scalp, when

[4] Journal of the Arkansas Medical Society, October, 1893.

[5] The histories Dr. Wyeth was so good as to place at my disposal, refer to eight cases, with nine operations.

the white cartilage lines can be seen in the intercranial sutures. Operation is useless in these cases, unless cyst or tumor be present. In the other cases, temporary improvement at least can be expected." In a letter published in the *Journal of the Arkansas Medical Society,* October, 1893, he says: "The operation is so dangerous that I shall hereafter undertake it only in cases of very marked microcephalus with undoubted symptoms of compression."

In reference to these operations Dr. B. Sachs says he has not advised them since 1891. He regards the danger "extremely great in all young children, the shock and uncontrollable hemorrhage from the scalp and bone being greater than most children are able to stand." And Dr. Arpad Gerster, who performed the operations for Dr. Sachs, expresses himself as follows: "The operation of linear craniotomy is a very serious one in small children, on account of the unavoidable hemorrhage accompanying it. Yet, in view of the otherwise hopeless outlook, I am still willing to undertake it in well-nourished individuals, at the direct request of their parents. As our diagnosis is very unsatisfactory as to the condition of the brain in microcephalus, the operation is often the only test of the presence or absence of cerebral structures which, if present, might develop, if the confinement due to premature ossification of sutures be believed by craniotomy. On the whole, my standpoint as regards the future of the operation, is not a very cheerful one." Finally, Dr. McBurney is only willing to perform the operation on the responsibility of a medical man in whose judgment and knowledge he has absolute confidence.

Lastly, and unfortunately, what is the result of the operation in reference to the intended enlargement of the cranial cavity? In a letter dated March 11, 1894, Dr. Vander Veer says: "Both Dr. Hun and myself have the impression that the skull has not expanded, but that there is some reason for believing that the resulting cicatrix in the scalp and membranes has caused a diminution rather than an enlargement of the brain." Bourneville finds a narrowing of its interior by thick fibrous bands encroaching upon it in a case the drawing of which he publishes,

and the cranium I here present, placed at my disposal by Dr. Burney Sachs, and twice operated upon by Dr. Arpad Gerster, proves the exact condition alluded to by Bourneville. Instead of enlarging the cavity the operation has diminished it. The whole lower aspect of the first craniotomy wound is thickened by about half a centimetre of a newly formed hard tissue; it presses down upon the brain which the operation was expected to relieve. The first operation was performed on September 20, 1891, the second on November 26th. Thus the changes you here perceive are the results of sixty-seven days revengeful action on the part of nature.

After all, Mr. President, that I could contribute to the knowledge of the operative interference with the condition of "enfants arrièrés," of idiocy, of microcephalus, it appears that, in the face of so many deaths and so few results, the operation is not promising of good to mankind. The operations thus far performed do not effect what they were intended for, they do not even enlarge the cavity. Wyeth knew that well when he made a circular groove and raised the bone from the dura mater forward, leaving a bridge of one and a half to two inches, which he fractured and allowed to heal. For a similar reason and in a similar manner Dumont,[6] treated a child of fourteen months with epileptoid attacks and strabismus. I am not informed of the condition of the bones or fontanelles. An incision was made from the forehead over sagittal suture until it reached the spina occipitalis externa. Galea and periosteum were severed down to the tubera parietalia. A number of trepanations were made, each of 2.5 ctm. in diameter. Gouge and saw were used so as to connect these openings and render the bone movable. The galea was sutured, no drainage applied, and the wound healed. Two months after the top was still movable and there was no epilepsy, and less strabismus. I am not acquainted with the final outcome. It is not improbable that the extensive denudation of the bone will have bad results in the shape of necrosis. I should rather believe that a circular incision and removal of the galea and periosteum,

[6]Corresp. Schweizer Ä, 23, 1893.

merely as far as required for a sufficient grooving of the cranium, would be safer.

If any cases be at all amenable to treatment by such an operation, they must be those of uncomplished premature ossification of the sutures and fontanelles. Such a one appears to have been that described by Akerman. He operated on a child aged sixteen months. Forehead narrow, circumference 40.1 ctm.; mother did not notice a fontanelle. Circumference of head was not changed two and one-half months after the operation, and the angles of the wound had filled up; ten months after the operation circumference was 42 ctm., the usual increase, perhaps a little less, of that age. And the final report, when the child was three years old, was that there were less convulsions than before the operation, and the mother says the child "knows the difference between me and a stranger."

An additional case was published by Dr. I. A. Dibrell, Jr.,[7] of Arkansas. It was that of a girl three years of age, circumference of head 16 inches (40 ctm.), bipar. diam. 4, occipito-frontal, 4⅝ inches. There was "complete ossification of all the sutures and fontanelles." Ten months afterward the operator reports: "I am unable to perceive the least improvement in the child's condition."

Dr. Roswell Park[8] operated on a girl of four years, for premature ossification. No result.

Dr. Willy Meyer's case died two days after the operation, with unexplained high temperatures.

Dr. Wyeth's case was operated on when eleven months of age; when the child was four years of age the mother admits he was "two or more years behind in mind."

Dr. Vander Veer's child was operated when thirteen, and again when twenty-four months old. A year afterward he was "better in some respects."

And that is all there is of it.

The relative impunity of operative interference accomplished by modern asepsis and antisepsis, has developed

[7]Journal Arkansas Medical Society, October, 1893.
[8]Medical News, December 2, 1892.

an undue tendency to, and rashness in, handling the knife. The hands take too frequently the place of brains. Who does not know that the alleged safety in operating tempts some of our skilled operators, and the credulous public, into useless or even contraindicated procedures? Who is not aware that but too frequently the first principles of diagnosis are not practised before an abdominal wall is opened? Is it enough to know that clean finger-nails, and nurses conversant with corrosive sublimate, and disinfected catgut, are almost universal safeguards against immediate fatal termination? Is it sufficient glory to don a white apron and swing a carbolized knife, and is therein a sufficient indication to let daylight into a deformed cranium and on top of a hopelessly defective brain, and to proclaim a success because the victim consented not to die of the assault?

Such rash feats of indiscriminate surgery, if continued, moreover in the presence of fourteen deaths in thirty-three cases, are stains on your hands and sins on your souls. No ocean of soap and water will clean those hands, no power of corrosive sublimate will disinfect the souls. Goethe once said the most interesting book that could be written would be a treatise on the errors of mankind. Let us see to it that our mistakes may not swell that book.

SOME PREVENTIVES

When your chairman tendered me the privilege of opening the winter session of your Section, I accepted that honor with great diffidence, for a stranger should not appear before a medical audience of Philadelphia, least so, before the College of Physicians, without some good reason. I have no new discovery to communicate, nor even a new name for an old one. What I can offer is less a contribution than an introduction to your labors.

Modern medicine is more successful than that of our ancestors for several reasons. The methods of examination and diagnosis are more numerous and more correct; etiology is better understood—amongst the recent aids to both etiology and diagnosis bacteriology and chemistry take no low rank—and the means of treatment are both ampler and safer. Medication has become more experimental and the empiricism of the bedside and of the operating-table is growing more imbued with and dependent upon the labors of the physical, chemical, and biological laboratories.

The object of medical science and art, however, is not confined to removing diseases; it includes also prevention. Again, it is the laboratories that have furnished new incentives to preventive medicine, by offering new methods or explaining and justifying old ones. The latter were frequently empirical only; still, quite often in the history of medicine, facts had to precede their explanation, and practice theory. An experiment is not necessarily infallible, a microscopical observation has frequently proved a mistake, and numerous clinical experiences which extend over a reasonable time and terminate in equal results are as worthy of acceptance as laboratory-research. They compensate one another and act in co-operation.

Prevention has learned a great deal from modern meth-

ods. As I, however, am not a pathfinder, nor even an expert in those branches that are by preference called exact by their creators and augurs, I shall speak of a few preventives that do not exclusively rely upon an immersion-lens, or a disinfecting stove, or on a bacillus-hunt—on all of which, it is true, clinical medicine, sanitary science, and the interest of mankind have to rely. I request you to follow me in the consideration of a few preventives—without accompanying experiments and camera-illustrations. I shall consider some few practical means of preventing deaths from puerperal fever and from the sepsis of the newly-born, also of preventing senile morbility, or rather premature senility, and finally, if your patience and time will permit, of preventing fatal terminations by medication.

The prevention of puerperal fever and of the sepsis of the newly-born, both of which are frequent causes of death, is best secured by the proper management of normal labors amongst both the rich and the poor.

What is it that is required to conduct a normal labor? The obstetrician, man or woman. physician or midwife, should have clean hands and body, short-cut nails, and unsoiled clothing; should know enough to distinguish a normal from an abnormal position, and enough of antisepsis to employ soap, alcohol, and corrosive sublimate in the usual proportions; should see to it that the room is aired, and the woman's clothing and her bedding absolutely clean. Her bowels should be moved by an enema; her bladder emptied, if necessary, by a clean glass catheter. A single examination should be made, to ascertain the position of the fetus; a single warm injection given, and no further manipulation permitted, with the exception, later on, in case of hemorrhages, of the administration of hot injections. The scissors with which the cord is to be cut, and the tape to tie it, should be kept antiseptic, according to the simplest known principles.

Immediately after labor a douche should be employed under the following circumstances *only:* If there be hemorrhage, then it should be hot, very hot; if there were purulent discharges before labor; if the fetus had been

putrid; if a hand was introduced into the uterus; if there were a laceration. Under ordinary circumstances the woman should be thoroughly washed with an antiseptic, and no soiled material should at any time be allowed to remain after labor, or on any of the following days.

The vagina should be left alone. It is aseptic in ordinary cases; the billions of bacteria swarming in it are not pathogenous; they keep the vagina acid, and do not admit pathogenous germs. Moreover, the operculum of the cervix, which is germ-free in its intrauterine part, acts as a partition between the uterus and the vagina. Finally, the amniotic liquor and blood will flush the vagina and contribute to keeping it aseptic. For these reasons no irrigation is required, or is even admissible before or during labor, unless there be gonorrhea, or carcinoma, or as the preliminary stage of an operation.[2]

Could women of average intelligence, who can read and write, be taught these things? We make doctors of them; why not midwives? Let them know that, under strict laws or regulations, they have to send for a doctor when there is an abnormal position; when labor is unusually protracted; when the woman's general condition appears to render it advisable; when part of the placenta is retained; when the perineum is torn; when there is an unusual odor about the lochia; or when there is an elevation of the vaginal temperature of the mother; or of the rectal temperature of the newly-born; or any anomaly about the latter. Every woman can be taught the use of the thermometer; the examination of the rectum in case of the non-appearance of meconium; of the skin for nevi, etc. No physician could do more, or should do more, in a normal labor. When it comes to the mystery of bandaging, a woman can learn that better than most men; and as far as the first bath of the baby is concerned, she can learn how to use water that has been boiled, and how to protect the eyes and the cavities against unclean admixtures.

2 Many of these points, amongst hundreds of other topics, are amply discussed by Dr. A. Brothers, in the William Furness Jenks prize-essay of the college of Physicians of Philadelphia, 1896.

Is there a need of midwives, or should every normal confinement be attended by a physician? What happens where there is no physician? In villages and townships I frequently heard of farmers' wives who had neither doctor nor midwife, but an untrained neighbor's wife to assist her. There is no question but that she would have been better off if she could have obtained the services of a woman prepared to attend her during her confinement and afterward to look after her and her baby.

Those of us who are acquainted with the conditions of the poor know that the cases in which the tenement-house women are attended—if the term may be used in that connection—by their friends and neighbors, as uninformed and unclean and incautious as themselves, are very numerous indeed. Diseases and deaths among both women and infants are very numerous. No obstetrical dispensary can take care of all of such cases. If it could, the physician could never render all the services required by mother and child during a week or more. The poor woman wants daily attention, her bed made, her linen changed, her body washed, her baby attended to. No matter whether a daily bath is given, or the baby be washed, or, as a modern gospel wills it, kept without bathing or washing, the diapers have to be changed, and the baby cleaned and kept clean. The cord is at least to be inspected, the mouth kept out of harm.

In regard to asphyxia of the newly-born anybody can be taught the following things: that it may lead to convulsions, paralysis, epilepsy, or idiocy; and that it should be prevented, or shortened, by all possible means; that unless there is a vital indication to assist the mother, the baby should be attended to first; and that the necessary means of resuscitation should be resorted to immediately. Any intelligent person can be taught to alternate a warm bath with a cold plunge, or the affusion of cold water, the raising of the head from the soiled bedding, the beating of the nates, tickling the fauces, the momentary inhalation of ammonia; the ligature of the cord when the pulse begins to flag, or instantaneously when deep asphyxia requires measures that cannot be taken while the baby is

in contact with the mother; also the method of artificial respiration of Silvester or of Laborde. Any intelligent woman may also learn that she should avoid blowing into the mouth or nares of an asphyctic baby, and should herself under no circumstances employ electricity for the purposes of resuscitation. During her course of instruction she may be told the reasons. She may forget these, but she must not forget the rules, which she must not break without incurring some penalty for her transgression. Personally, thirty or forty and more years ago, when I had a large obstetrical practice, I met many a woman taught in trans-Atlantic countries, who knew most of these things well and obeyed to the letter the rules imposed upon her by teaching and by habit. That was self-understood, and no difficulty was encountered.

The woman can also be taught and be compelled to leave alone a hydrocele, a hematoma of the scalp or of the sterno-cleido-mastoid muscle; a milk-induration of the infant's mamma with the exception of the very gentlest massage; and the usual form of a febrile jaundice. She can learn to treat the cord without fat or oil, and with an aseptic dry powder and gauze; a red eye with a 1 or 2 per cent. solution of silver nitrate once a day until a doctor sees it; and accidental or an occasional congenital constipation with an enema. She will know that a sore cord or skin, or an eruption, a sclerema, a hemorrhage, a hernia, or a rise of temperature requires the presence of a practitioner, though there are some preliminary measures she should be acquainted with and which she should not omit to employ.

During her instruction she will learn, and when she begins a practice, she will be held to give no medicines whatever, and no food-compounds beyond the mixture of aseptic, that is boiled, milk with water or a thin cereal decoction. There are some things she will learn, easily comprehend, and practise, that even no doctor out of twenty knew or lived up to a score of years ago. She will learn how to treat, or rather how not to maltreat, the infant-mouth; that the integuments of the newly-born, both epidermic and mucous, undergo spontaneous des-

quamation and thereby become very vulnerable; that the mucous membrane of the mouth, and particularly that of the alveolar processes, is very thin so that a mere screaming spell renders its posterior part anemic and tense during the traction of the pterygoid muscle alone; that the slightest pressure by the hand or a coarse cloth during the washing or other cleaning of the mouth may cause ulceration that heals slowly and opens the gates of infection in the buccal cavity to the aphthæ of Bednar at least; to the same extent and in the same way that harm is done later on by the inconsiderate lancing of the gums, which is known not only to injure the tooth, and to alter the gums, but also to furnish opportunities for septic invasions. These are simple things at present. A few years ago they were revelations to us; still they are so simple that they are understood by the plainest mind.

However, if an intelligent woman can learn and do all this, she is not above a doctor. Why should not a doctor have that obstetrical practice, and why should it be taken away from him? Because part of the work outlined and suggested is nursing and not medical. The medical man has no time and no wish for it, and, perhaps, no dexterity. Amongst the well-to-do he employs a nurse for those things. He should live on his medical practice, and not starve on it.[3] That is why he is expected, and hopes, and longs to be, and is, in daily contact with infectious diseases, and liable, almost certain, to disseminate them. Conscience and law should prohibit a medical man from engaging in both general practice and obstetrical work. That is so well understood, that in large cities there are medical men who refuse everything but confinements, which are their specialty. Such rich persons as engage their services know they are applying to a man or woman in whose knowledge and asepsis they have reason to repose implicit confidence. But the vast majority of parturient

3 We are not so fortunate, as, according to Herodotus, the ancient Egyptian doctors, "who had many advantages," he says; "who spent and consumed none of their own property, but ate the ritual offerings, and received every day many geese, and meats, and wine."

women are poor, and it is the families of the poor that have most babies. There are no specialistic obstetricians for the poor, obstetricians cannot live on missionary work; they must be paid; and the vast majority of such cases must go without that privileged kind of service. It is amongst part of this class, as long as it is not absolutely abject, that poor doctors practice and try to make a living and future practice; from scarlet fever and typhoid they go to a case of labor, and from one infected case to the next. In that respect they are not much safer than an uninformed, untrained, unwashed female attendant.

I am told that doctors must live. Surely they must, but perhaps not as doctors. Many would be better off in some other vocation, or business. There are but few of us who are predestined by nature and gift for the practice or science of medicine. Indeed, many of us would have served both themselves and mankind as well in some other capacity as in medicine. For most men and women—most of the man-and-woman question is one of livelihood—embark in their preparations for either their calling or their trade without a fixed character or ethical aim. That is why, from all points of view—too many to be considered here—it is improper to entice the average of immature boys or girls into medicine.

I said, doctors must live, or should live; but the women should also live, and so should the babies.

In order to do so they require the application of simple medical and dietetic and hygienic knowledge, which should be furnished either gratuitously or at the lowest price, that is at such a price as no physician could or should be satisfied with. The community, the State, has the greatest interest in saving women and babies, if only for economic reasons; for every human being dying early is a loss of labor and means. From that point of view, and as a matter of morality and ethical duty, none should be sacrificed that can be saved.

The prevention of puerperal fever of women and babies is not an exclusive matter that concerns the poor millions only. Every case of puerperal fever, erysipelas, scarlatina, or diphtheria in a distant tenement-house endangers

the rich also. It is from the poor that their help comes, their servant-girls, cooks and coachmen, their laundresses and perhaps itinerant teacher, aye, even their clothing, ready-made in a sweatshop.

It is easily seen that sometimes the absence of a busy doctor from the bedside of a parturient woman and her baby may be a blessing. It is the all-around doctor in large practice who has the greatest number of obstetric and of scarlet fever and diphtheria patients. The greater his reputation the worse his cases. How many times I had a tracheotomy and a confinement in the same night, and hurried from the former to the distressed woman, in order not to be too late for the final act, I cannot tell now. We know that those were well off who could not wait for the arrival of the doctor, and had to be satisfied with the faint-hearted congratulations of the unwashed and disappointed medical man. In spite of Holmes and Semmelweiss, I am afraid I saw as much puerperal fever as any living obstetrician of those times. The general statistical figures are simply terrible. M. Boehr collected for the years 1816-1875 the deaths in Europe from cholera, which were 170,000, from variola there were 165,000 deaths, from puerperal fever 363,624. Many of the last occurred after Oliver Wendell Holmes, in 1843, proved puerperal fever to be a contagious disease—while still, in 1844, the great Litzmann characterized it as "a febrile miasmo-contagious disease peculiar to puerperal women"—and after Semmelweiss reduced, by the use of calcium chlorid, the mortality from 12 to 1.2 per cent. The statement that puerperal fever is on the wane at present should be taken with many grains of salt. Since I gave up the practice of obstetrics, personally, I have still been amongst those who had the fever, and not infrequently met with several cases in the practice of a single practitioner, also of a single midwife. The patients die, but do not always appear under the heading of puerperal fever, which is no longer passed by with respectful awe by searching health-officers. Those deaths are ascribed to pneumonia, pleurisy, peritonitis, parametritis, nephritis, or endocarditis. That is the way in which statistics are doctored by the doctors.

I do not pretend to speak here of the ills doctors are exposed to, but of those prevalent amongst the people. In the interest of the people it would be better if there were midwives, sufficiently educated, controlled by health-boards, and willing to make a decent living—sufficient for them—amongst the population at large, where the fees are too small and the services required too onerous for medical men or women. How they should be educated, and how controlled, cannot now be discussed. I believe means to that end could easily be found; more easily perhaps than 25 years ago, when the whole question was brought up in the Medical Society of the County of New York. In that discussion one per cent. of the members present voted for a legal status of midwives. I think I was that one per cent. Then, as now, it had to be admitted that midwives, or such as claimed to be midwives, existed and practised, as the case might be, their innocuous, dangerous, or nefarious methods. But the profession refused to favor the legalization and control of midwives. What was the result? Midwifery schools were established by quacks.

A gentleman who lately opposed, before the section of obstetrics and gynecology of the New York Academy of Medicine, the legalization and control of midwives, said that the average midwife is entirely incapable of foreseeing complications, and of grasping, and still less carrying out, the principles of antisepsis. That is true of the present midwife whom nobody teaches and nobody looks after. Before we were better taught and looked after, was it we that did better in either internal or operative medicine, or in obstetrics? I remember the time quite well when it was considered discourteous not to request every one of the medical bystanders to examine the abdominal cavity after an operation for strangulated hernia. As the patient was under chloroform, it did him no harm. It did the undertaker lots of good.

We are told by the same gentleman that children suffer even more than the mothers. Stillbirths in Berlin, he says, occur in 3 per cent. of confinements, in 8 per cent. in New York, where midwives are not controlled, but permitted to

practice upon the recommendation of a single physician. I should here add that in Berlin they have hundreds of midwives, instructed and supervised; very few or none in New York.

If we are told that midwives are "most inveterate quacks, and never acknowledge their ignorance," I should say, let them be punished for it, as a doctor is for his mistakes or crimes. I also share the opinion that "a war of extermination should be waged against the pestiferous remnant of pre-antiseptic midwives and schools of midwifery;" and we all say amen, and—include the doctors.

Our author says it would probably be necessary to respect the so-called "vested rights" of those who formerly practiced midwifery. That opinion I do not share; for the law of the land has done away with the "vested rights" of the quack doctors very speedily and vigorously as soon as the right of a citizen to have a respectable or at least "chartered" doctor was once recognized. And why should there be "unsurmountable difficulties" in the way of legal supervision of midwives, when that procedure is so very simple in reference to five or ten times their number of medical men?

Thus, when a bill was proposed to abolish midwives for all future, for the reason that "midwives by their ignorance and lack of cleanliness do great harm to parturient and lying-in women, and assume to administer potent drugs to them without the advice of a physician, and often treat sick women and children, and frequently are guilty of causing abortions," we are expected to take it for granted that women cannot be taught to learn and to wash, and to keep from doctoring and medicating, and causing abortions, and that it is only a chartered medical man who is able to be clean and aseptic, and unable to cause abortions. "Credat Judæus Appella."

On the other hand, in the county of Erie, N. Y., "midwives, after having passed a successful examination, are entitled to practise midwifery in normal labors, and in no others; but such persons shall not in any case of labor use instruments of any kind, nor assist in labor by any artifical, forcible or mechanical means, nor perform any

version, nor attempt to remove adherent placenta, nor administer, prescribe, advise, or employ any poisonous or dangerous drug, herb, or medicine, nor attempt the treatment of disease, except when the attendance of a physician cannot be speedily procured, and in such cases such person shall at once and in the most speedy way procure the attendance of a physician. The board of examiners shall have power to recommend to the judge of Erie County the revocation of a license, and said judge shall have power to revoke the same.

"Any person who shall practise midwifery, or, without the attendance of a physician when one can be procured, attend a case of labor within the county of Erie, without being duly authorized so to do under existing laws of this State, or without having received and recorded the certificate named above, and any person who shall violate any of the provisions of this act, shall be fined . . . and shall forfeit any certificate theretofore granted under the provisions of this act." (N. Y. State law.)

It has always appeared to me that satisfactory instruction and control of midwives are easier than the same in regard to practitioners of medicine. What the former have to learn and to practice is limited. Ignorance and malpractice are readily detected. How difficult that is amongst practitioners of medicine becomes apparent to those who mingle with many in examinations and in consultations. At all events it is clear that a more careful and aseptic guidance of the mother and of the newly-born will save the lives of both women and infants. Is that difficult to obtain? If it is, it is not easier for practitioners than for midwives.

Of the deaths of infants that take place during the first year, 25 per cent. occur in the first three months. Many of the causes of this waste of life are beyond medical aid. Seasons and climates, race, city or country, soil and dwelling, precocious marriages, financial circumstances, the prices of foods and dress-goods, the prevalence of endemics and epidemics, of alcoholism and syphilis, the ignorance of the people and of medical men, are amongst the most influential causes of excessive infant-mortality. Many

of them could be prevented by social improvements, which have to go beyond the puny efforts of floating hospitals and fresh-air piers. Still even they prove that the public conscience and the sense of mutual responsibility are awakening, and it is to be hoped that our people will rise to the recognition of its own perishing reconcentrados, young and old. The English infant-life protection-act of 1872 and the French *loi protective des enfants* of 1874 are amongst the first instalments of the public debt paid to infant-life. Foundling hospitals and asylums and special hospitals have partially missed their aims, for no other reason than because the laws of infant-life, health, and mortality were, and still are, but imperfectly understood. It was mainly the frontier territory of the pathology of the very young that was a terra incognita. Our ignorance was the cause of indolence. It became an axiom that nothing could be done with and for small infants. It has taken a long time for us to be taught that no class of our population and of our patients is more endangered by waiting idleness—we prefer to call it expectancy—than the very young; and I fear it will still take a long time before the physician who is thoroughly conversant with the physiology and pathology of infancy will be officially recognized as a peer amongst the teachers of medicine, and pedology as one of the most desirable facts of medical science and art.

As we are only now emerging from the stage of childhood in the evolution of medical education—I should know something about that, having been connected with teaching institutions these 40 years—we should, perhaps, not expect pediatrics to take a high rank amongst the acknowledged branches of learning in our medical schools. As late as 1859 there were no systematic courses of instruction in pediatrics in our country. Amongst the first, however, who paid attention to it at all, were a number of Philadelphians. After Rush and Bard there come Caldwell, in 1776; William P. Dewees, in 1825; Joseph Parrish, in 1826; William E. Horner, in 1829; W. W. Gerhard, in 1833; D. F. Condie, in 1847; J. Forsyth Meigs, in 1848; Ch. D. Meigs, in 1850, and my friend Parry,

who died too soon, a few years afterward. The first special clinic, for which a single weekly hour was considered all that could be spared, was established in the New York Medical College in 1860; it died, with the college, in 1865. Since that time similar clinics have gradually been established all over the States; but pediatrics is not yet given a leading part. In most colleges the attendance upon children's clinics is not obligatory this very day. Few professorships exist for pediatrics; and they are mostly nominal. The neglect shown it by the official faculties is readily taken by students as their guidance, and the results are unavoidable. Infants cannot complain, and they cannot vote; even less so than the privates in an army. The old principle, "infans nondum homo," an infant is not quite a human being, has not died out yet. That the embryo and the fetus are of still less account is only too true. Genuine humanitarianism has not yet risen to the dignified place held even by the unborn in the teaching of at least two religions—the Jewish and the Roman Catholic. After all, I hold that teaching pedology as an obligatory study, mainly at the bedside in children's hospitals, and raising it to the dignity of full chairs in our leading institutions, is amongst the most valuable means of reducing infant-mortality.

As the principal mortality of the first year is due to disorders of the digestive, and that of the following period to those of the respiratory organs, the preventive measures to be taken appear to be self-evident. Infant-feeding has been made relatively safe by the methods calculated to destroy pathogenous germs; I say pathogenous, for the presence of others in the milk of women, and in the meconium, and in the stomach of the newly-born, as early as a few hours after birth, is either indifferent or beneficial. By rendering infant-food germ-free, a number of diseases and deaths are prevented; mainly, the army of infectious intestinal disorders, with consecutive renal, meningeal, encephalic, and respiratory troubles, not to speak of the chronic marasmus that swells the death-lists often without an appreciable anatomical cause.

Now, beyond the means of prevention furnished by bac-

teriology, we have not advanced much these scores of years. The same questions belonging to the chemistry of the milk, and to the composition of infant-food, are answered differently in different quarters, with equal assurance. A famous author, in spite of the physiological fact known these 30 years, that there is saliva and pancreatic juice in the infant economy, has only lately been converted to a faith in farinaceous foods, and is experimenting with other than milk-sugar; and he comes to the conclusion, based on I do not know how many sleepless nights, that the feeding on woman's milk may be carried on too long. Many begin also to find out that cow's milk may be done to death by inconsiderate cooking, and that the latter is not rendered more sacred or more wholesome by calling is sterilization.

The belief that infants and children require much food is correct. They require material not only for reproduction, but also for increase. In order to gain 25 grams daily during the first half-year, they require daily from 8 to 10 grams of proteid, 2.6 of which are demanded in the interest of growth. But over-alimentation during a normal condition has its serious drawbacks which should be prevented: Dilatation of the stomach, and diarrheal diseases, rickets, adiposity, disease of the skin, convulsions, biliary and renal colic, and myasthenia and myagia depending upon the accumulation of phosphates and lactates in the muscular tissues. Over-alimentation may also lead to atrophy in different ways, so that the diagnostician of a case of atrophy has not to look for starvation in intestinal disease only. When the stomach is too full the gut does not digest. A few months ago, before the Moscow Congress, von Mering detailed the following experiment: He cut the duodenum and sewed the two ends to the abdominal wall. When the stomach was full, and the intestine was full, the function of the stomach ceased. When the intestine was empty the stomach would work and discharge its contents. Until then, no normal secretion of hydrochloric acid would take place, but decomposition only. In this way stuffing leads to illness and atrophy. This may happen besides, for reasons that we

should be anxious to discover, when there is a sufficient amount of food, and when the stomach and the intestines and feces appear to be quite normal, so that there is no sugar, and but little albumin and fat left in the feces. Even the bowels were found sterile in such cases. The only changes discoverable were in the middle-ear, in the bladder, and the pelvis of the kidneys, which may have been infected from the intestinal tract. These infants suffer from pain and sleeplessness, furunculosis, phlegmons and gangrenes. This is one of the many classes of disorders in which the ubiquitous claims of bacteriology are not sustained. We have to return to organic chemistry to fathom the most occult mysteries of nature.

In a short evening the problem of infant-feeding cannot be solved. Permit me only to add a few fragmentary axioms that I look upon as best fitted to improve the infant's health and to prevent disease: Cow's milk can never be made like woman's milk. Their physical and chemical compositions differ; mere dilutions do not change the abnormal character of cow's casein. Farinaceous decoctions protect the infant against this abnormal casein better than water. Milk-sugar, though contained in milk, is not always the best sugar to be added to artificial foods. Plenty of water in the food of infants prevents many forms of dyspepsia, and secures normal function of the kidneys and of the liver.

Infarctions of uric acid are frequent, and those of a hemorrhagic and pigmentous nature are not uncommon, and calcareous deposits are at least of occasional occurrence in the kidneys of the newborn. Gravel and stone are frequent in infancy. All these foreign masses lead to disintegration of the endothelia, to hemorrhage, and to inflammation. Moreover, the rapid destruction of the red blood-cells in the normal newborn, and the transformation of hematin into hematoidin, which is identical with bilirubin and biliverdin, lead to obstructions and thromboses. It is a large supply of water that should be given to every newborn as a matter of course, while the milk-supply is absent or scanty, that will prevent many of the dangerous ailments of the first weeks of life.

An exclusive cow's-milk diet is a mistake, no matter whether pasteurized or sterilized; it may cause one-sided overalimentation, such as has been described, and occasionally it produces, or aids in producing, scurvy. Cow's milk and farinacea require an ample supply of salt.

Patented artificial foods are modern achievements markedly beneficial. Like the compound pills of the wholesale druggist which are dumped on your office tables, and the medley of composite sweatshop productions of the wholesale book-manufacturers, artificial foods produce horses and carriages, town-mansions and country-villas, bonds, stocks, and bank-directorships. But further deponent sayeth not—this evening.

Early infancy and advanced age are equally endangered by a high morbility and mortality. Among the working-class of France, as represented in trades-unions, Villermé found that between the 20th and 30th years a man would be sick 4 days annually, about the 40th year $5\frac{1}{2}$, at 50 years $9\frac{1}{3}$, at 60 years 16, at 70 years 75 days. Can this disproportion be prevented, or if not, can it be modified?

"Senectus ipsa morbus." In advancing age, between the 50th and 70th years, even earlier in many, the symptoms of old age become apparent. The blood diminishes in quantity; so do its solid constituents; it is mainly the red corpuscles and the fluid albumin that decrease. The big blood-vessels become first enlarged by the loss of elasticity in their media; in many there are atheromatous deposits, and blood-pressure decreases from both causes. Part of the capillaries disappear altogther; that is how general nutrition is impaired. The latter suffers besides, on account of general atheromatous degeneration. The heart, unless locally diseased by valvular endocarditis, is flabby and its muscle feeble, and thus no longer able to propel the former amount of blood with its previous vigor. This condition, however, is not always detrimental, for a strong current would overdistend and perhaps burst the blood-vessels that have lost their elasticity and contractility.

The adipose tissue, the skin and most mucous membranes and the muscular tissues (voluntary, intestinal, and vas-

cular) undergo atrophy. The nervous system loses much of its excitability and energy.

The loss of teeth, and changes in the respiratory, digestive, and glandular systems interfere with assimilation, respiration, and sanguinification; the bones become fragile; finally even the brain, though the very last to do so, participates in the general atrophy. Cold temperatures, exertions, and acute infections, also emotional depressions, undermine the power of resistance, which may be impaired, and bad results may then be prevented by warm clothing, external heat, a cautious mode of living and a greatly stimulating occupation.

At every period of life a vigorous but adequate metabolism is required.

Exercise takes its first effect on the muscles; through them on the blood-circulation and the lymph-circulation and on the respiration. A man at rest breathes 12 or 16 times a minute, and consumes 8 liters of air; when marching from 30 to 36 liters; muscle, when active, consumes and produces 20 times as much gas as when relaxed. In that condition it generates large quantities of carbonic acid, more sometimes than corresponds with the oxygen received. The carbonic acid is accumulated, and consequently respiration is increased to remove both carbonic acid and residual air. The heart's action is intensified, and blood-pressure is increased. When this condition is kept up, or exaggerated, cardiac dilatation, or hypertrophy, or both, may be the result; mainly so when the heart-muscle is physiologically feeble, or diseased. No man in advanced age should forget that the one organ of his body that never is permitted absolute rest is the heart. That is why it requires unusual care. Old men should use the bicycle, if at all, with discretion, for the ascent of a single hill may dilate their hearts by an inch or more; and exertions after meals should be strictly avoided.

Digestion suffers, in advanced age, with the rest of the functions. Meals should be eaten slowly, be less copious, and fewer, particularly when no or little labor is performed. Good artificial teeth add, however, to life and its enjoyment. But meals should be small in advancing

years. If there be anything that convinces me of the fact that all of us eat too much, it is the small quantity of food some old people, mainly women, live and thrive on. Old people should not eat unless they have a desire for food; the occasional omission of a meal will do good. Whatever is not required for the equilibrium of a healthy metabolism swells the chances of atheromatous degeneration, of rheumatism and gout, of cholelithiasis and nephrolithiasis, and of diabetes. The principal evil is done by the prevalence of too much black meat in the food; an exclusive meat-diet is not counteracted by means of hot water, though a cunning quack says so, with great success to himself. If George Keith quotes St. Paul as saying that "strong meat belongs to them of full age," I hope he meant the vigorous age of those who do hard work. The same writer is my authority for the statement that in Buenos Ayres, where the people consume a great deal of meat, anemia, rheumatism and neuralgia are frequent. Neurotic and neurasthenic people bear but little meat, and different temperaments, as Schöpf Merei knew 60 years ago, require a conscientious adaptation of their foods. Nor should the belief in the innocuousness of certain foods, although they be taken in large quantities, be encouraged. Not what is swallowed, but what is digested and assimilated, is beneficial. Milk is not always tolerated in large quantities, and plain milk without some change, either by mixing with cereal decoctions, or with dilute hydrochloric acid, is seldom digested for any length of time. The old mixture of Dr. Rudisch, which I have used extensively these 25 years and eulogized ever so often, consists of dilute hydrochloric acid, water, and raw milk in proportions of 1:250:500, brought once to the boiling point.

I am so convinced of the good effect of a spare diet in old people, that I have often insisted that the change be made. In consequence, I have frequently seen aged men and women with sour temperaments, flatulency and muscular and mental incompetency, become cheery and active —nor old people only. According to Keith's East Indian experience, it is the unanimous verdict that spare frames and spare eaters bear tropical climates best. Three-hun-

dred pounders do not prove satisfactory. The teacher who initiated me into the mysteries of the alphabet was very frail and was considered tuberculous. Being so lucky as to have to live on the equivalent of $30 a year, and not striking oil at any time, he lived on healthy but spare diet up to his present age of 87, which he spends with books and painting. Thus it happens that the feeble should not be despaired of; they may reach an old age, while the very vigorous, who do not suffer at once from their transgressions, are tempted by this apparent immunity to repeat them and succumb to their consequences. Nor do I think that the old Egyptians would, altogether, protect themselves against the results of their indiscretions by their custom of taking a purgative and an emetic three times a month.

As a rule, alcoholic beverages and tobacco are not well tolerated by aged people. Alcohol, when used regularly, though in small quantities, favors adiposity. I think I have observed a great many times that with increasing arteriosclerosis both become less acceptable, and sometimes distasteful. There are exceptions, as there are even in regard to the greatest danger to old men, viz., sexual excesses. If a stimulant be demanded, a small quantity of an alcoholic beverage, with plenty of hot water, provided it is not the habitual, though moderate, drink; or, better still, an ammonium, or a camphor-preparation, will be borne best. Drinks and clothing should be warm and a warmer climate selected; that does not exclude, however, that the cutaneous nerves and the circulation should be strengthened by the cautious use of cold water and short sessions of massage.

Water is not required in the same quantities that are demanded by the activity of all functions in early and middle life. Nitrogenous food requires more, to do away with its refuse. The liver and kidneys of the old, however, may become exposed to the same danger from the lack of water as those of the newly-born. If much is required, or is wanted, it should be taken in small and frequent doses, to save the shaky heart and the arteries from sudden overexertion and overdistention.

Should elderly and old people sleep long? That depends, provided they be of equal health and vigor, in part on their occupation or labor. Physical labor requires much sleep, mental less.[4] Physicians who labor both physically and mentally require more sleep than most of them can, or think they can, afford. As a general rule, old people who sleep long and eat much, provoke senile degeneration. Long sleep and big meals should be in inverse relation to one another.

By attention to the suggestion contained in these remarks, premature symptoms belonging to old age—otherwise the most incurable condition—may be prevented or postponed. Some of them are merely physical and referable to the organs of circulation. Myocardial changes are mostly responsible for congested liver, for dyspnea and for alleged nervous palpitation; and cardiac and arterial degenerations cause angina pectoris, and fainting spells. But the brain does not only suffer in its physical sphere, and from mental incompetency; the emotional life is affected also. Calcification of arteries goes hand in hand with that of ideas and of sentiments. The crotchetiness, distrust, and vehemence of old age is of arteriosclerotic origin. I knew an erudite, lovable and famous man, known all his long life for his gentleness and restful ways. Quite suddenly his temperament changed, without visible alterations of his physical life, to such an extent as to cause general surprise and regret. My prediction that he would soon die was verified by his speedy death from apoplexy. Such occurrences may be prevented, or postponed; but is it worth while? If the foolish question has been raised: Is life worth living? the other question may be justified: Is a long life worth attaining.

4 Tissues and organs do not suffer equally from exhaustion, or waste. Atrophy leading to death consumes 90% of all the fat, but only 30% of all the albuminates contained in the body. The liver loses 70% of its fat, the brain none at all. The albumin disappears mostly from the muscles and from the skin, but less from the muscle of the heart than from those of the rest of the body. Evidently heart and brain can stand a great deal of wear and tear, and have to.

A conduct according to sensible hygienc rules does not only prolong life with the outlook of merely procrastinating the undesirable symptoms, but age may be made to advance uniformly and without a disturbance of equilibrium. Then the capability to work may be less, but wisdom will take the place of activity, and serenity that of pushing restlessness. Nor will work be impossible. Those to whom it was an enjoyment will always be able to perform it under the influence of its mental stimulus. That is why so many who never looked for enjoyment as such, and as the principal aim to be reached, remain young, though they have lived long, and may mingle with and learn from those young in years.

Still, there are those who do not judge life by the number of sunsets they have seen, but by the amount of labor performed in their own interest or in that of mankind. There was your townsman, who died of old age while still young, but forced more beneficent work into a single year than many gifted men into a decade. He knew it was overwork, and also knew his personal danger. If he preferred to live in the memory of the present and coming generations to staying here in the body long and comfortably, that was his right, and, as he saw it, his duty. As medical advisers, however, we do not deal with exceptional cases, but with the average individuals of the race; it is for them that our rules are made, and to whom our advice is given. Those with ways and aims and horizons of their own, select their own paths.

The actual treatment is not unpromising. It is true, however, that arteriosclerosis is more or less universal and progressive. To control it, the avoidance of injuries is of more importance than medicines. The slow, gradual, indeed physiologic variety is not attended with much danger, unless it be complicated by bronchitis or kindred disorders, which are often fatal. When it is pre-eminently renal the prognosis is worse, though not so bad as in the advanced cardiac form. The cerebral variety may prove fatal at any time, but, on the other hand, it may pursue a slow course, and even bear apoplexies with ease for shorter or longer periods.

The objects of preventive and curative treatment should be to make arteriosclerosis as slowly progressive and as uniformly physiologic as possible. Thus the harmony of well-developed and strong manhood will gently evolve into that of equable enjoyment and gradual decline.

The methods employed for the reduction of adiposity, which is a frequent prodrome or complication of senile changes, are attended with certain dangers. When emaciation takes place rather suddenly, cardiac weakness and neurasthenia are common occurrences, and even moderate exertion causes dilatation of the heart. Arteriosclerosis depending on syphilis requires great caution, for it is as little improved by mercury as many other manifestations of "metasyphilis."

The main treatment of progressive senile changes should be directed against uncommon arterial pressure, which means, mostly, an impediment in the peripheral circulation; perhaps also against sclerosis as such. There are more means to combat the former than there are to benefit the latter. Moderate gymnastics, manual and mechanical massage, horseback-exercise, walking, also skating and cycling without overexertion, and a very moderate amount of climbing, are useful muscular exercises, but they should never overstrain the heart. Massage in the warm bath acts beautifully; still better the carbonic acid of mineral baths, such as those of Nauheim. Massage and missage are, however, different things. It requires anatomic knowledge to alternately compress and release the blood-vessels and lymph-ducts between the muscles, and few but medical men will ever be good masseurs.

Amongst the drugs, the nitrites act favorably by their power to dilate peripheral arteries, and the iodids by lowering blood-pressure and regulating the peripheral circulation. Cardiac insufficiency, which is brought about either by peripheral resistance, or by myocardial changes, or by both, requires, besides massage and rest, an occasional purgative and frequent diuretics; the use of milk in renal arteriosclerosis whose first uremic symptoms are dyspnea, headache, vertigo and tremor, and, I think, in gout also; when there is much venous obstruction with mild cyanosis,

an occasional venesection; or when much cardiac dropsy, calomel. Diuretin, or better, theobromin—now and then morphin—acts much more safely than digitalis, amongst the preparations of which it is principally digitoxin that in the usual daily doses of from two to three milligrams is too likely to contract peripheral arteries, and thus to increase blood-pressure.

The last evolution of life is death. Still, even death may be deferred and eased by the methods not only of hygiene and diet, but of pharmacotherapy. The latter has been blamed for its insufficient effects when applied to impossible tasks. As long as it was not founded on clinical observation and on experimentation, it was unsafe and unreliable. When, however, absence of preconceived theories, instruments of precision, and experiments on animals gave it a standing amongst the exact sciences, its claims grew. Unfortunately, the action of an internal remedy cannot be followed by a lay eye, like the knife of the operator, and the prejudices of the public, founded on its ignorance, have too often guided the very opinions of the medical man.

When the Vienna school, following the French under Broussais and others, elaborated pathological anatomy and diagnosis—I refer mainly to Rokitansky and Skoda—they declared that diagnosis and autopsy were the only quintessences of medicine. Even Wunderlich proclaimed in his early career that medicine should be science, not art. But the very accuracy of the diagnosis and of autopsies facilitated the appreciation of the effects or of the failures of medicines. The co-operator of those illustrious men—Hebra—proved every day of his life that diseases, hitherto incurable, were cured and healed by local treatment. The isolation of morphin by Magendie, and of numerous alkaloids afterward, rendered medication more accurate and controllable. Annual experiments added wonderfully to the certainty of drug-action;[5] it was soon learned that much of that certainty was due to the chem-

[5] Experiments on man himself have always been the results of brutality or of ignorance, and do not count. Experimentation and observation are not identical.

istry of the drugs; this was the first step in the direction of compounding new drugs by synthesis. By immunizing animals against the toxins of certain bacteria, bacteriologic research has created serumtherapy, and clinical experience has added organotherapy, with its wonderful results as far as tested. It takes all the egotism and mental limitation of the most famous modern serumtherapist to deny the great value of organotherapy. Still, Behring goes further than that. He coolly asserts that there is no such thing as experimental pharmacotherapy; as he never knew of it, it should not exist. He belongs to the class of men who are generally not bent upon underrating the significance of their own doings; it was left to genuine medical men to be overmodest in the appreciation of their labors. There has been, for instance, an egregious amount of talk among us about the power of nature and the incompetency of man. "Natura sanat, medicus curat." Nature is the healer; the medical man just takes care of the patient, and sees to it that nature can perform its work. For instance, you are told you do not heal a chlorosis by giving iron; you simply make the diagnosis and furnish the iron, and nature's stomach and intestines and pancreas and lymph-apparatus do the healing. It is nature that saves, not you. You imagine you heal a man poisoned by plasmodia by giving him quinin; you are mistaken, it is nature that grows cinchona-trees, absorbs the quinin, circulates it and destroys the plasmodia. You think you save a man by cutting down on an appendicitis or a liver-abscess; far from it; you are only the scavenger, but nature forms exudation and adhesion and closes the wound. You keep the skin and table and instruments aseptic and prevent suppuration, and think you did some praiseworthy thing in the way of prevention; you are mistaken, for nature did it by furnishing water and a healthy cell-proliferation and permitting you to compound soap and corrosive sublimate. You find a man in the gutter suffering from sunstroke kindly furnished by maternal nature; you take him away, work over him for hours with ice or stimulants and friction—no thanks to you, it is nature that empties his cerebral blood-vessels, elimi-

nates toxins, and restores him. You jump into the river and resuscitate a drowned person; I am mistaken—not you saved him; for it is nature that sets the machinery of his heart and lungs agoing. If "nature" gave him no respiratory and circulatory centers what could *you* do? Or you find a starving man, with a loss of one-third of his weight and in the delirium of hunger, your milk and whiskey and beefsteak never save him. For if nature had not given that man digestive organs and gastric juice and absorbents, poor you, where would you be! Or you are called upon to heal a fracture; you cannot heal it at all; all you can do is to adapt the ends of the bones and keep them in juxtaposition. Can you make new cells? Can you form callus? The only thing you can perhaps do is to appear in a malpractice suit. You are not responsible for his recovery; but you are made to answer for an alleged irregularity of nature's doings. You say all this is farcical? So it is, but the absurdity of it is not mine. If there is anything insipid in man's so-called reasoning, it is this unmeaning wise-acredom of the relations of "nature" and doctor to each other, and the playing with words. "Words are grown so false, I am loath to prove reason with them" (Shakespeare, "Twelfth Night," etc.).

Nature does not kill and does not heal. If there were consciousness in nature, she would feel indifferent about what she is, viz., mere evolution. Nature is sunshine that grows harvests and sunstrokes; she makes moonshine for lovers and for burglars, and rain to feed men and to drown them, and the sun warms the unjust and the just. Nature is a Mauser bullet; stand in its way, you are hit; dodge, and you are saved—it makes no difference to nature. In nature a diphtheria-bacillus has its democratic rights and duties like George Washington, and it killed him; she has not predilections, no reasoning; she is cause and effect. She can be led and doctored. The engineer heals her deformities in the interest of commerce; insurance companies correct her failures or calamities; indeed the logical mind of man and the logical necessities of "nature" are engaged in a constant strife for superiority. In matters of health and disease of homo sapiens the doc-

tor utilizes or combats the doings of nature. By caring he cures. Curing has long ago lost its literal meaning.[6] It is healing.

What I mean by prevention—I may say prevention of death—in acute febrile diseases may find a brief illustration in the roborant and stimulating treatment of pneumonia During health, the innervation and force of the heart are not easily disturbed, but every pulmonary disease taxes its powers. There is no pneumonia that may not require cardiac stimulation some time or other, for the heart is sure to suffer within a few days from dilatation, first of the right side. To what extent cannot be foreseen. The principle of waiting for symptoms to turn up is a bad one. If medication were injurious by itself, that would be an excuse for not resorting to it. When heart-failure or collapse, however, has once set in, our remedies are mostly too late. Then to busy ourselves with our subcutaneous, medicinal or rectal hot-water injections or a perfunctory dose of digitalis, not "ut aliquid fias," but "ut aliquid fieri videatur," is preposterous.

The weakness of the heart is by no means physical only, viz.: the result of the overexertion caused by the difficulty met by the blood in its passage through the lungs, but it is dynamic and physiologic. Like all other infectious fevers, pneumonia acts probably by its toxin on the functions of the heart-structure, and by impeded circulation the heart is certainly injured in its own nutrition. As far as the facilitation of pulmonary circulation is concerned, it is not improbable that strophanthus acts even better than digitalis; at least physiologists like Cushing tell us so. The inference is that whenever we require an improvement of the pulmonary circulation for the purposes of oxygenization and of the aortic circulation in behalf of nutrition, and of the rapidity of circulation in order to facilitate the elimination of toxins, we shall do well to use strophanthus and digitalis in combination.

Should medication begin when collapse is setting in, or has occurred? This procrastination, with its sad results, may be illustrated by some comparative procedure. It

[6] "Curare."

is parallel to the plan of estimating the value of feeding by giving nourishment when inanition is complete, and not before. When the donkey of the gospel disappears in a ditch on Sunday, make haste to pull him out on Monday. Allow the child to drown in your well, and be sure to cover it up—the well, I mean, on the day of the funeral. Build earthworks quickly when the enemy is in your camp. That is the theory on which antitoxin is injected on the fifth day, instead of the first or second, alcohol is refused in cases of sepsis, digitalis in dilatation and weakening of the heart, ice in peritonitis, morphin in alcoholic delirium, or venesection in acute overdistention of the right ventricle. These are not cases in which, as Musser says, "possibilities for good or evil cannot be estimated"; they belong to that very large class in which it is "necessary to invoke remedies directed to the removal or counteraction of a definite cause."

Statistics are said to prove that pneumonias will get well without medication Which pneumonia, and whose? It should be a great satisfaction to a man dying of pneumonia to learn that his neighbor got well without medication, if stimulation in time, perhaps venesection, might have saved his own individual life. It is the duty of the physician to judge of and to treat his individual case, and not the pneumonia of Louis and of Dietl, and of other statisticians. Treat the man who is sick, and not a Greek name.

Prevention by medication and other treatment can be easily demonstrated by some such instances as follow: Most of the non-congenital diseases of the heart in the young and old are rheumatic. Endocarditis is liable to start quite early in acute rheumatism; indeed, in some cases it precedes the joint-affection. The physician is either called, or arrives too late to prevent endocarditis. My order is invariably, after a single attack of rheumarthritis has occurred, to go to bed, for one or more days, on the slightest recurrence of pain, and to take a number of doses of sodium salicylate, which are kept ready for use. No delay be permitted. Thus many a case of endocarditis, or return of endocarditis, is prevented.

Relapses of ulcers of the stomach are often preventable. I do not claim that all those which depend on embolisms during a chronic endocarditis, or on cirrhosis of the liver, can be greatly influenced, but the frequent form observed in young anemic persons may be prevented by antacid medication. It is self-understood that a careful and restricted diet, mostly milk, slow eating and small meals, are the sine qua nons of treatment.

The treatment of the intestinal tract is partly dietetic, partly mechanical, partly medicinal, as of most diseases of other organs or systems. Disorders of the bowels, which could have been removed, lead to disturbances of the temperament and the mind, to night-terrors and convulsions, to rhachitis, to intestinal absorption with fever and erythema and other skin-diseases, not quite rarely to peritonitis, to cystitis from the immigration of intestinal bacteria, and to toxic nephritis; in other not uncommon cases to visceral abscesses. I need not go into particulars before this audience. Most of what I have mentioned is preventable by medicinal and dietetic treatment; and the old physicians, with their maxim "qui bene purgat, bene curat," hit the nail quite frequently.

Rhachitis has a tendency to get well; that is, under favorable circumstances the softened bones grow hard. Moderate curvatures disappear, or nearly so, after years, and the flabby muscles become strong and active. Should we let it alone, and not employ air, and proper food, and cold water, and phosphorus, and iron iodid, and cod-liver oil in mild as in bad cases? What we have to expect, or to fear, in every case of rhachitis, are stunted growth, deformities of the extremities, the trunk, and pressure by the chest-wall on the chest; and secondary hypertrophy of the heart, subacute and chronic bronchial catarrh, with bronchopneumonia and the possibility of tuberculosis; laryngismus stridulus, with possibly sudden death: hydrocephalus and imbecility or idiocy. These serious consequences of rhachitis may be prevented by treatment. The hyperemia of the rhachitical skull and brain tends to physiologic irritation and growth; not infrequently, formerly the rhachitic children were the best scholars, and amongst the

geniuses of history there are many rhachitic heads. But, if the physiologic hyperemia is permitted to become pathologic, the result is meningitic effusion and insufficient or faulty growth. To treat rhachitis in time means to add beauty and brightness and intellectuality to the world.

Phosphorus, mentioned already in connection with rhachitis, may be utilized as a preventive in other directions.[7]

The structure of the blood-vessels may be very defective, their walls being thin, fragile and pervious. In such cases hemorrhage, small or copious, is a common symptom. The frequency of hemorrhages in the newly-born, leading, when in the cranial cavity, to asphyxia, convulsions, idiocy, or early death, is caused besides by the lack of coagulability of the infant's blood, by the thinness of the vessel-walls, whose tissue has not yet quite evolved from its embryonal state. This or a similar condition may continue for life. This hypoplastic state, however, is not, of necessity, general; it may be local. The early nose-bleedings of some, though they have no heart-disease, and the congenital tendency to aneurysm in places where the elastic tissue, either from arrest of local development or by microbic destruction, is either scanty or absent (mostly at the origin of branches), prove the occasional occurrence of these circumscribed and local defects. That thinness which predisposes to fatty degeneration of the intima and media, to sclerosis of the adventitia, to atheromatous endarteritis, and to the formation of aneurysm at an early age has not been made the subject of active treatment, so far as I know, except by myself. The number of such cases is naturally small compared with the total number of a large practice or clinic; but I feel convinced that the administration of phosphorus—not phosphates of any kind—with its stimulant effect on the growth of connective tissue in general, has rendered me good service in habitual tendency to cutaneous, mucous and internal hemorrhages. Hemophilia of a moderate degree and local, as it frequently occurs, appeared to improve under its use, and the children to be safer and better developed.

7 See my "Therapeutics of Infancy and Childhood," 2d Ed., p. 530.

Nasal catarrh is apparently one of the mildest, as it is one of the most frequent affections of infants and young children. Their narrow nares, their creeping on the floor, and poking their sweet, dirty fingers into every accessible cavity have far-reaching dangers. Nasal catarrh, with its hyperemia and soreness of the mucous membranes, predisposes to and causes chronic hypertrophy, adenoid growths, tumefaction of submental and submaxillary lymph-bodies, invasion of diphtheria and tuberculosis, and occasionally meningitis. That is so true, that adenoid growths of moderate size will get well without operation, solely by regular nasal irrigations The latter alone will prevent and mostly heal the majority of the consequences mentioned. The hyperplastic, so-called scrofulous swellings of the neck in children, when not too old, will disappear when the original seat of the infection and irritation is attended to. Many a bacillus-hunt would not be required if other preventives of diphtheria were employed in time.

The same should be said of the mouth. Hypertrophy of the tonsils, many forms of stomatitis, diphtheria, probably also most of the rare forms of tuberculosis and neoplasms of the pharynx can and should be prevented. I have always made it a rule to keep all the integuments clean. At least once a day a physiologic solution of salt-water is poured through the nares of every infant or child over whom I have control. Big adenoids should be removed, large tonsils resected. There is more danger in a dirty nose than in an unwashed face. Only do not be satisfied with merely ordering it. I have met with many a "trained" nurse who did not know how to inject or to irrigate a nose. A mother or a child's nurse should be instructed by you personally how to do it. Here, as everywhere, when two do the same thing, it is by no means the same. There are many cases of nasal diphtheria, such as are most likely to resist the influence of antitoxin, which are still spared a fatal termination by persistent and correct irrigation of the nares and naso-pharynx.

What is our verdict in the case of a medical man who would refuse artificial respiration to a drowned person,

or water to one afflicted with gravel or gallstones, or an antidote to a chemical poison, or antitoxin in bacillary diphtheria, or mercury, or potassium iodid in syphilis, or quinin in malaria? That death, or long suffering, or life-long invalidism is prevented by appropriate treatment in these extreme cases is well understood; but the principle underlying all this holds good everywhere. Let me select a few more instances only. A baby with hereditary syphilis is kept under treatment for several months, gets well, and is discharged. The child grows up and develops symptoms of syphilis at about the period of puberty, or about the twentieth or even the thirtieth year. These are the cases of so-called "retarded syphilis." There are but few mothers with large families, growing old in hard work, that are endowed with a sufficient memory to recollect the illness of the baby born long years ago; and there are, in large cities where syphilis is mostly seen, but few medical men who see the same patient when a baby and when grown up. That is why, when syphilis is seen about the fifteenth or the twentieth year, it is easily believed to be its first appearance, unless there be a history of the disease. Personally I have seen but few such cases in which I could not trace this retarded syphilis back to the infant-eruption, so that the assumption of hereditary syphilis in the adolescent or adult not preceded by that of the infant has become rather doubtful in my mind. Now, what is the lesson taught by such cases? It is in the same way that you insist upon protracted treatment of acquired syphilis in the adult, and allow, for instance, no matrimonial alliance, unless the person has been free from the last symptoms for years, that the baby with hereditary syphilis should be kept under treatment and observation for years to prevent relapses and consequences.

These relapses and consequences need not be characteristically syphilitic. They may be—as Fournier calls them—parasyphilitic, and exhibit symptoms of all sorts of dystrophy of early or late rhachitis, of scrofula, or of tuberculosis. The constitution undermined by syphilis, the tainted blood, the impaired mucous membranes and slightly swelled lymph-bodies furnish ever so many inlets to in-

vasion of different kinds. Besides, there is a peculiar class of cases with which we have a great deal to do. They occur in children of from 5 to 8 years, who are reported as having never been sick, but never well. They are not always listless, and languid, but they are anemic, thin, pale, under-weight, and easily tired. You find no organ diseased, and the blood-count is not pathognomonic. If you leave them alone, and with the consolation that the seventh or the fourteenth year will set matters all right, you leave death or life-long invalidism alone. Many of these children have syphilitic fathers in whom the disease was, or was believed to be, extinct when that child was conceived. In those cases think of syphilis. No arsenic and no iron, no country air or hydrotherapy will do them any good before they have been treated carefully and persistently with mercury. These are the cases in which mercury adds to the number of red blood-cells in a remarkable manner. It has often appeared to me that the absolute belief amongst our predecessors in calomel, which was considered indispensable in all the diseases of infancy and childhood, was in part founded on the frequency of just such cases.

Pertussis is a self-limited disease. Nature will get through with it; but in many cases with the child also. As long as whooping-cough lasts there is danger from hemorrhages, from convulsions, broncho-pneumonia, and perhaps connected with it, from tuberculosis; cases of encephalitis, spastic spinal paralysis, hemiplegia, posthemiplegic chorea, and paralysis of the abducens have been observed. Some of these direct results are liable to occur during the height of the disease. If we shorten the duration of the illness we prevent its opportunities for mischief. One of the first convincing experiences of this kind I had when a young practitioner. An infant with whooping-cough had a severe convulsion with every attack. Three days and nights either I, or a substitute, sat by, chloroform in hand, which had to be administered dozens of times every day. There is no doubt in my mind that by this active treatment I prevented either death or cerebral hemorrhage, with idiocy or epilepsy.

SOME PREVENTIVES

In gonorrhea of the male, or female, what do we prevent by active treatment and great care? Stricture and epididymitis may not count for very much, and aspermia in the male may not be estimated a great misfortune, but there are many here who have seen gonococcal arthritis and polyarthritis, endocarditis, septicopyemia, and death, or at least, ankylosis and long suffering. And the woman who is the victim of a man that was insufficiently treated over the apothecary's counter, or by his medical adviser, and perhaps thought himself freed of his gonococcal tenants! We have all seen from that cause endometritis, salpingitis, peritonitis, parametritis and perimetritis; and if not death, or lifelong invalidism, both of which do happen—at all events, sterility. Most, or all of these, could have been prevented.

Fine principles, when put to the test of daily practical experience, lose sometimes much of their ornamental glitter, and much of their usefulness. We hear the saying, and pass it on, that simplicity is of the greatest value in practice, and that a compound perscription is the damnation of the practitioner. If there be one indication, or one alleged indication, there should be one remedy. Here is an example: In a case of collapse, lowering of the head is a good remedy; compression of peripheral blood-vessels another; hot-water injection into the rectum a third; salt-water infusion, either subcutaneous or intravenous a fourth; the hypodermic use of alcohol, of camphor, of strychnin, of digitalis, of caffein, a fifth, sixth, seventh, eighth and ninth, the internal use of musk a tenth, and many more. If there be any simplicity and one remedy preacher who means to live up to his own notions and teachings, let him decide as to the single one of the indicated remedies he will select. There are only a few things that are quite simple and uncomplicated; one is a corpse, and the other a coffin.

Who is it that made the rule that a prescription must contain one drug only, not two, nor three, though they chemically be ever so compatible, if not the nihilists who preached that there is nothing in medicine but autopsies, and that medicine is a science and not an art; or, perhaps,

it was only exaggerated antagonism to the yard-long theriacs of the Middle Ages. If there is in illness an uncomplicated condition, give an uncomplicated drug; but be sure that the organ to which you direct your remedy is also simple and uncomplicated. Is there such a thing? Let me again take the example of the heart. When we speak of heart failure, or a debilitated heart, does that not mean something more than the flabbiness or over-extension of an Indian rubber bag? A heart is composed of muscular, intercellular, fatty, elastic tissues; it supplies all the organs with blood, and is itself thus supplied. Its circulation is pulmonary and nutrient. Its blood-vessels are exposed to the anomalies of all of the rest of the blood-vessels. In its nerve supply there are sympathetic ganglia and fibres; there is the pneumogastric, there are fibres coming from the medulla, and in the medulla there is the head center of the circulation. Its normal innervation is that of the contracting muscle and of inhibition besides. If this compound body fails in its co-operative action, is it probable that a single drug will restore it in all instances? In some, certainly, for the strengthening of inhibitory power is often sufficient to gradually restore the disturbed equilibrium; but in many cases the circumstances are not so simple. Digitalis acts in many ways; according to Traube the slowing of the heart's contraction is its main effect; but aconite has a similar effect without any muscular influence. Digitalis increases arterial pressure, so does strychnin; digitalis causes diuresis by raising tension in the renal arteries; it has that effect in a lesser degree than strophanthus, which influences the arterioles less markedly. Digitalis also raises the blood pressure, and thereby improves the nutrition of all the tissues, that of the heart included. To its action on the heart, and also of the arteries, is due the rapidity of circulation; when, however, its contracting influence on the small arteries is too intense, that rapidity is stopped. To restore it nitrites are employed.

Strychnin increases arterial pressure without an inhibitory effect. That is why, when only a moderate amount of inhibition, but competent pressure is required, small

doses of digitalis should be combined with good doses of strychnin. Inhibition is rather paralyzed by atropin; that is why rather large doses of digitalis are both tolerated and beneficial when combined with atropin. Sparteïn has little direct action on the heart-muscle and depresses the inhibiting pneumogastric; that is why digitalis, when its muscle effect is demanded, is borne when combined with sparteïn, in fair doses, for a long time in succession. Such combinations are not only permissible; they are requisite. I give such combinations, say of 4 decig. daily, of digitalis or its equivalent with half the amount of sparteïn for six weeks with perfect safety without going to see the patient, with no cumulative effect; the latter cannot always be avoided when digitalis is given alone. Though I must be brief, I should not conclude, however, without the remark that the combinations of so-called heart stimulants may be much more various. Like strychnin, ergot affects the medulla and the spinal-cord centers. Caffein, camphor and ammonia stimulate both the heart and the vasomotor centers; hydrastis both the vasomotor centers and the peripheral vasomotors. Adonis appears to be almost identical with digitalis in its cardiac and arterial effects; strophanthus, with its modified action on the heart and principally on the arteries, finds its associates in convallaria and apocynum.

Fragmentary though these remarks have been, there is but one conclusion to be drawn from them, viz., that it is sounder practice not to rely on a single remedy when the disorder is multiple, and the tissues complicated. To win battles and to render war the reverse of ridiculous, you want the co-operation of brave troops, of well informed and conscientious officers, an experienced commissariat, expert engineers, and an effective medical administration; not a single one of them only. In addition, you want to be sure of the condition of your armamentary—be they rifles or drugs. It is true, here as everywhere, that brains come in handy for guidance.

In closing, allow me to thank you for your patience in listening to the many fragmentary remarks I took this opportunity to make. The stand I take in the mid-wife

question from a social and sanitarian point of view will probably be shared by many who will acquaint themselves with the ever-increasing necessities of the crowded millions of a large city or of the forced hermits of the backwoods. Nor will much objection be raised to what I presented in connection with premature senility. I am, however, not quite so certain about the universal approval of my views on therapeutic preventives in the different camps of medicine. Indeed, I am quite aware that many of those to whom we are under great obligations for services rendered to the advancing medical sciences will quickly disagree.

Anatomists, physiologists, chemists, bacteriologists—all these pillars of etiology and diagnosis—should, however, suspend judgment. What I said was in the interest of the man, woman, or child not yet on the autopsy-table. The demands of actual practice in hospitals and at the private bedside cannot dispense with the results of the labors of those mentioned; but clinical medicine requires more than the knowledge of morbid changes and their causes; it demands means to prevent, to relieve, or to heal. That is what creates the superiority of clinical medicine over the special branches of study, and its standing as the first of all humanitarian sciences and arts. When this will be fully understood by the hosts of medical students and young practitioners, therapeutics in all its parts, diet, hygiene, and drugs, will receive greater attention.

The latter deserves it more from year to year, with the increasing results of laboratory-research, which adds to accuracy and safety. It is a queer spectacle to notice that the use and abuse of drugs is growing with the actual or pretended indifference of medical men in regard to them. More than $200,000,000 annually are spent on proprietary medicines in this country. The pirates of the single-pill persuasion are ably seconded by the wholesale manufacturers, who supply you not only with their wares, but with the formulæ of your prescriptions. The contempt in which we are held by some of them is, perhaps, best shown by the way in which they show their conviction of our absolute ignorance. It is only a few days ago that I re-

ceived a circular in which I was taught a prescription for subdividing a certain quantity of a synthetic drug and white sugar into twelve powders.

As our medical schools are to furnish not only scientific specialists, but the physicians and the sanitarians of the country, I trust the time will come when, like the present anatomic, physiologic, histologic, and bacteriologic instruction, a course in a pharmaceutic laboratory will be compulsory.

SPECIALISM AND SPECIALISTS

Ever since medicine envolved from the stage of genuine popular medicine, when the sick were no longer carried to the market place to be benefited by the advice of the wayfarers,—who, as always, then and now, had enjoyed the same disease—there have been specialists. The ancient Egyptians had nearly as many as we have, and even all the savage nations—according to Bartels' (Medicin der Naturvölker, 1863, p. 61), have several classes of medicine men and specialists.

Limitations to a special remedy is nothing modern.

Old Cato, the arch enemy of Carthage and of the Greek physicians who immigrated into Rome, cured everything with cabbage and incantations. Antonius Musa, who lived one and one-half centuries later was the first exclusive hydropath of the old style that used cold water only. He cured the Emperor Augustus and enjoyed riches and honors. The Emperor's nephew, Marcellus, however, died under the treatment, and Dio Cassius charges the doctor with having killed his patient—tout comme chez nous.

According to Suetonius, Vespasian cured the blind by his saliva, and the lame by his touch. His hospital was the temple of Serapis in Memphis, Egypt. According to Nepotianus, King Pyrrhus of Epirus cured diseases and deformities with his right toe—now-a-days some corrections require the application of the whole foot. *Remedio erat si cujus remes tumentes eo teligisset.* The fact can easily be proven; for when the body of the king was cremated the beneficent toe remained intact and was preserved in a gold box in the temple of Dodona. No further proof is required.

Amongst the old specialists ranks Edward the Confessor, of England. Amongst the numerous beneficent kings of England—all kings are—the Edwards, Charleses,

Georges, etc.,—he was the first to display the peculiar power claimed for the kings of England of curing patients afflicted with scrofula, and to found the special service of the "healing." But Joseph Trask Payne, in the Fitzpatrick lectures for 1903 (Oxford, 1904), with the fortunate lack of piety characteristic of some historians, tells us that the story is first found in the Gesta Regum of William of Malmesbury, written some eighty years later. Edward's rivals in the same special line were Robert, son of Hugh Capet, Philippe of France, and Olaf of Norway in the eleventh century. So Scrofula was called the King's evil. But they were only second-class miracle specialists. They were not the real thing, they required actual physical touch, while to-day we or some prefer distant treatment—equally efficacious.

The belief in the specialistic powers of the kings remained alive until the end of the eighteenth century. Louis XVI. had it and touched the scrofulous until he was guillotined. The French revolution and Napoleon believed in less mystical procedures. But even Ambroise Paré, the great surgeon, who fought the poisonous character of shot wounds, who ligated arteries instead of cauterizing them, who abolished castration as a part of the radical operation for hernia, who introduced the truss and improved trephining, who, moreover, was unprejudiced enough to dislike a quack only when he could learn nothing from him, believed in the efficacy of the royal touch for the King's evil. Nevertheless, there was no accomplishment of the secular mighty that could not be improved upon by the holy.

St. Agatha restored the milk in the breasts of women. Her martyrdom consisted in having her breasts cut away. That is why the faith of the people endowed her with that peculiar beneficent gift.

In Northern Italy the pilgrimage to the small church of S. Mammante, in Belluno, and the drinking of a nearby spring had the same effect.

St. Anne cured the eyes.

St. Judas, the coughs.

St. Valentine, epilepsy.

St. Rochus cured animals, the first specialistic veterinarian to whom I have been introduced.

They were all saints. Perhaps some of our miracle-working specialists would do well to add sanctity to their other accomplishments.

Urine specialists developed in early mediæval times. Two thousand years previously the urine was utilized by Hippocrates as a diagnostic acid; Galen distinguishes its many colors and sediments; the Arabs and the mediæval Hebrew physicians studied it very carefully. The physician and patient's urine appear to have been correlated; if in Venice a slave died—about 1100, under the benevolent rule of the Christian Conqueror Godfrey of Bouillon—the doctor, if a Christian, had to pay his master the full value; if a Hebrew, he was hung with a urine glass in his hands. Specialistic practice is no longer so dangerous in our time. It is probable, however, that the public—at present for instance—is more credulous in regard to fads than the doctors.

The following is reported of the doctor of Charles IX. of France, about the middle of the sixteenth century. He was a great astrologist and uroscopist who diagnosticated out of the urine the patient's age, sex, constitution, temperament; also location of rooms, curtains, bed, and what not. A great lady sent him the urine of her cow. The great man studied that urine and told the messenger: "Your lady feeds too much on vegetables."

As a remedy, urine has been utilized for centuries. It is still holding its power over the misguided popular mind. In connection with all the excreta, intestinal and others, of man and animals, it forms the contents of the "Dreck-apotheke," "filth medication," of Paullini, an otherwise meritorious practitioner and writer of over two centuries ago.

Organ specialists were numerous in mediæval times; they had traveling operators for calculus, for hernia. Some had a high repute, some the reverse.

There was a man by the name of Taylor, who somehow or other was in possession of personal recommendations written by Boerhaave and by Haller. He really had the

honorary appointment the court oculist of almost all European courts. Finally he received a diploma from Frederick the Second, called the Great, who wrote: "Now all his wishes are fulfilled. He is my court eye-doctor, but I tell him my eyes require no doctoring, and if he dares to touch the eye of one of my subjects I shall have him hung, for I love my subjects like myself." Said court oculist distributed circulars in which he said of the other fellows: "Every eye-doctor has a certain way of making himself famous; they differ only in this, that one brags more insolently and coarsely than the other."

Now, several dozen years ago Samuel D. Gross, when speaking of the rapid increase of specialism, chuckled over what he considered an eternal fact, namely, that there were no specialists for the appendix. He did not live to see himself taught differently. Not only have we appendix operators, but a subdivision of an inch and a half appendix operators. I am no prophet, nor have I hats that men would take on a bet, but I should not wonder if our ingenious Robert Weir's utilization of the opened and ventrifixed appendix for the cure of inapproachable ulcerations of the colon and perhaps even membranous enteritis will live to rank as a specialty. At all events you have stomach specialists, gastro-enterologists, proktologists, and still further down what has not yet been baptized proktovaricologists. But you have their specialty. There are those who treat rectal varicosities, and even those who treat them according to one method—the injection of carbolic acid. They never fail, for their practice is specialized to such an extent as to permit other men to write the death certificates necessitated by liver abscesses or pulmonary emboli.

There are other specialists not yet recognized by Academies and Congresses. There are the rheumatism doctors. Aches and pains, and twitches and stiffnesses—are they not all "rheumatism"? Does not everybody know that better than you? Then there are nodes and bunches: that is gout or rheumatic gout. Some of them have heard of salicylic acid and of its many compounds. Some use hot air only, some use cupping. Like Mother Goose

"Some use it hot,
Some use it cold,
Some use it in the pot
Nine days old."

All make or try to make a living out of other folks' aches, and feel better than they. Then there are the osteopathic rubbers, whose leaders are the men who have spent no effort at all in accumulating their profound ignorance, and whose only merit is to have been ousted out of Buffalo by the Board of Regents. That is why they are favored by some of our lawgivers. What no anatomy ever did, what a trauma sometimes accomplished to the great detriment of the patient, viz., the dislocation of vertebræ, they do in a twinkling, and I have been told it does them a great deal of good. Then there is the hygienist, who prescribes raw beef and hot water. Every patient knows beforehand what his orders will be. He believes it all because it is so absurd—*credo quia absurdum est;*—that is why he goes to benefit the oracle by depositing his fee.

There is his neighbor, the "naturopath," who murders the English language; there is the electric belt prophet, the $5,000 magnetic shoe, the nostrum vendor, who was protected by our twentieth century New York State Legislature (see proceedings of May 3rd, 1906), for two moral reasons: first, because a correct label would tempt the drunkard to know how much alcohol there is in "Peruna," and in "my-mother-took-it Sarsaparilla"; and second, because our good friends the retail druggists want to sell the poison indefinitely.

It would do you good to know all these prospectors, in order to be able to send your prescription to an honest place. There are the drummers of Arkansas Hot Springs, of Nauheim and Carlsbad, the Academicians, who while reading a scientific Sectional paper on May 3rd supply all the reporters of the morning papers of May 4th, 1906, with typewritten abstracts for the populace to enjoy. Address is given; no office hours—that would not be ethical, don't you know?

I am not a bold man, but I must walk up to the very latest in the evolution of specialism that I know of. It is "Refractionism." It gives me intense pain, I assure you, to refer you to the following title of a paper published by George M. Gould, M. D., of Philadelphia, in *American Medicine,* December 23, 1905, his own journal. It reads:

"One patient's experience with two general physicians, one neurologist, one leading physician, one gastrologist, two ophthalmic surgeons, one diagnostician, and one refractionist."

In that same article you find the following: "The gastrologist makes a false diagnosis of hyperchlorhydria, and *more suo.* never asked what caused this symptom, orders the old hypnotics, 'rest and travel,' and himself goes to dinner with his conscience. The leading practitioner says 'ditto to the honorable gentleman.' He also has heard of the banal idea that such diseases may be due to eye-strain, but it is, of course, beneath his dignity to think of such foolishness. He must hunt LL. D. degrees, consultation cases, presidencies of societies, professorships, and newspaper fame; to help solve the mysteries of actual disease, either from sympathy with the patient or to further medical science is not his function."

Draw your own conclusions on the aberration of taste and of the sense of propriety occasioned by the fanaticism of over-specialization in a bright man in his editorial position, a leader of medical thought and morals.

Specialists are not of to-day or yesterday. They are in part the evolution of human necessities. We should distinguish, however, between different kinds of specialties. There are those connected with the study of and practice on organs; and those derived from the necessities of treatment or methods of treatment; and those confined to the intricacies of research. I cannot be very specific to-day, but I want you to review for a moment our modern American literature. We have a new class of journals only a few years old. When the *Journal of Experimental Science* had been published a year, Clifford Abbatt told

me in one of his letters: "We have nothing of the kind in Great Britain." Since that time, we have a journal of Physiology, one of Anatomy, one of Medical Research, one of Infectious Diseases, and one on Biological Chemistry. Medical science and art is growing through the specialities, as a temple is growing out of its corner and other stones, its columns and roofs, or as a refined dwelling is composed of halls and rooms. Such special journals and labors should be received, and are received, with gratitude and enthusiasm—the more so when we consider that nine or more of ten men who are engaged in that kind of special labor deprive themselves of the opportunities of conquering the vast horizon that is, or should be, the property of the practicing physician. Indeed the man who gives a year or years to a special limited study, sacrifices himself in the interest of medical science and art. I say science and art. For the most sterile results, apparently, of experimental work lead finally—sometimes speedily—to the greatest practical advantages. What we object to is the narrowness exhibited by the tyro only, who looks at the world of medicine from between his two blinders. This world is what he, poor thing, is permitted to see between them. But let twenty men in the same laboratory, each for himself, or two hundred—get engaged in a specialized study, for you to look at the results after a year or after ten years. In this way bacteriology has been built up, not, as what it was claimed, all there is of medicine, but as the fertile handmaid of pathology, and hygiene, and diagnosis; a handmaid, not pathology, not hygiene, not diagnosis itself. It never was irreproachably correct; never will be, as long as it is the result of human endeavors. The picture under a microscope is nothing indisputable, its significance need not be what the first enthusiastic observer made it out to be. What it turns out to be eventually depends upon the eye over the glass, and upon the brain behind the eye. It is with our brains that we see and hear, not with the external organs. Within a few days only I have been told that the bacillus acidi lactici is no bacillus at all, but a coccus. Time and again have we been taught that what was taken

for detritus was really cocci. After all, we are beginning to learn that as bacteriology was and is the modern aid and enrichment of pathology, so behind pathology and behind bacteriology there is to come a still greater special power, physiological chemistry.

The specialities connected with treatment and its methods are many; they are as numerous as the many systems of medicine connected with the philosophies of consecutive centuries, and concocted out of the whims and obstinacies of its founders. The last century has seen Brownianism, Mesmerism, Hahnemannism, Broussaism, Rademacher, hydropathists, nihilists, and all sorts of dogmatics. Therapeutic nihilism is something very tempting. Of thirty-five sick, one only will die, if you leave them all alone. Is not that fact a splendid incentive for the laziness and indolence of what has been called expectant treatment? In the very year of my graduation—I give myself away by saying that it was in 1851—Joseph Dietl, Professor in Kracow (1804-78), said as follows: "Our practical work does not compare with the amount of our knowledge. Our ancestors laid much stress on their successes in the treatment of the sick; we, however, on the results of our investigations. Our tendency is purely scientific. The physician should be judged by the extent of his knowledge and not by the extent of his cures. It is the investigator, not the healer, that is to be appreciated in the physician. As long as medicine is art it will not be science. As long as there are successful physicians, so long are there no scientific physicians. Our power is in knowledge, not in deeds."

"As long as medicine is art," he says, "it will not be science." That is true. In past centuries medicine was art only. That is why it went astray in creeds, faiths, and systems. It was only the second half of the nineteenth century that began to establish medicine as science *and* art. That is why modern medicine rejuvenates its disciples, and amongst those who have sworn allegiance to the new flag there are *no old* doctors.

About the same time Rokitansky preached the doctrine that pathology was the only essential thing in medicine.

The ideal patient was the man who was satisfied with being percussed and auscultated by Skoda and autopsied by Rokitansky. About the same time—remember it was the time when modern medicine was in its teens,—Rademacher appeared. Hydropathy was the only beatifying system. Electricity cut its teeth, soon decaying, as a panacea, and vegetarianism became a new gospel. As there are credulous people everywhere, not amongst laymen only, Roentgen and Radium are now extolled as if they were the pets of legislatures and of retail druggists, and of unlabelled nostrum drunkards.

Nihilism was popular amongst those who were disgusted with the ill-tasting big bottles of the old practitioners, and those who studied and observed. Its influence is still felt. The great book of that great man, William Osler, is defective in that it teaches you very little therapeutics. It is true he acknowledges the action of a number of powerful and more or less specific remedies, and expects and hopes for more from a perfected chemistry. I agree with him. But somewhere else he says: "diagnosis, not drugging." I beg leave to say: first, diagnosis; then treatment, drugging included. I am quite willing to subscribe to what Robert Bartholow said in a Baltimore address thirty years ago: "He who despises his art can never become a great artist. Good practitioners are always found to be men entertaining the greatest confidence in the powers of medicine."

One of the hygienic fads I mentioned is vegetarianism, which, according to many, includes milk and eggs. That there are doctors amongst its apostles, goes without saying. They will advertise their business, which to them is no longer a vocation, and their ignorance accumulated in nobody knows how many years. One of them has come out lately (Dr. I. Stenson Hooker), with the following advantages of vegetarianism: "that sort of food is more refined. By it, mentality is clarified, new thoughts spring up, the prognosis in diseases is better, the face is toned up, the step more elastic; and the face, voice, and expression more refined. The atoms of the refined feeders are smaller and vibrate more rapidly." I want you to under-

stand that this is a quotation. I take it for granted that you did not know the refining powers of potatoes, turnips, pumpkins, cabbage, and squash.

J. G. Rademacher was an old country physician near the Rhine. He was an oracle in his village. That is why in 1841 he created a new therapeutical system, which he published in two big volumes. His remedies were either organ medicines or universal medicines. The former, as we now see it, could not well hit the organs, for there is no means of diagnosis in the book. The latter were taken by some sort of a chance, in connection with the teaching of Paracelsus that the nature of a disease is recognized by the drug that cures it. So Rademacher selected sodium nitrate, iron, and copper as the three great foundations of nosology. There were saltpetre diseases, iron and copper diseases.

With Hahnemannism you may be acquainted more or less. Perhaps more, perhaps less. At all events, it has always appeared to me that, as the homeopathy of a hundred or of fifty years ago was accepted as a faith, so its condemnation was partly a matter of faith. Here is—partly in extract and partly literally—what Hahnemann began to teach in 1796:

"The only vocation of the physican is to heal; theoretical knowledge is of no use. In case of sickness he should only know what is curable and the remedies. Of the disease he cannot know anything except the symptoms. There are internal changes, but it is impossible to learn what they are; symptoms alone are accessible; with their removal by remedies the disease is removed. Their affects can be studied in the healthy only. They act on the sick by causing a disease similiar to that which is to be combatted and which dissolves itself into thus similar affection. The full doses required to cause symptoms in the well are too large to be employed as remedies for the sick. The healing power of a drug grows in an inverse proportion to its substance." He says literally: "Only potencies are homeopathic medicines." "I recognize nobody as my follower, but him who gives medicine in so small doses as to preclude the perception of anything medicinal in them

by means either of the senses or of chemistry." "The pellets may be held near the young infant when asleep. Guiding the hand over the patient will cure him, provided the manipulation to be done with firm intention to render as much good with it as possible." Such is the homeopathy of Hahnemann, which is no longer recognized in what they call homeopathy to-day. Hahnemann was learned, so he found it easy enough to adopt the principle of potentialities from Arnold of Villanova, who lived 400 years before, and that of similia similibus from Paracelsus. The causes of his immense success we need not examine to-day. The gradual changes of homeopathy into its modern existence are due to the softened habits and the scientific spirit of all practitioners of medicine. The violence of language of one hundred years ago has given way to courtesy; the religious fanaticism, to tolerance; the revolutonary spirit of those troubled times to a moderate progress; and the then prevailing mysticism, to the spirit of research. Moreover, the persecution and exclusion from medical societies of the homeopathic practitioners by the regulars has ceased, and there is but little required now-a-days to have a single flag wave over a united profession.

Specialism applied to organs will always exist. Perhaps the distinguishing lines are to be drawn more positively than at present. The combination, for instance, of dermatology and syphilidology in the programmes of the great congresses appears absurd. The joining of dermatology and scarlatina or smallpox would be quite as justifiable.

On the other hand, there are those who disbelieve in the segregation of certain groups of affections which are acknowledged by others to be genuine specialities. When Howard Kelly went to Madrid three years ago he was prepared to deliver an address on "the passing of a specialty." The great gynæcologist does not believe in characterizing gynæcology as a special branch. We know from evidence that according to modern surgeons, their field is everything accessible to the knife and tool, and the pelvis of a modern gynæcologist extends from the

knee upward and is only—perhaps only—limited by the diaphragm.

But, after all, where is the end of a specialty if the specialists do not agree. When André, in 1743, wrote his "Orthopédie ou l'art de prevenir et de corriger dans les enfants les difficultés du corps," he included in orthopedics the errors of vision and speech, and the troubles of the nose and mouth. His French successors, such as Bouvier, included cleft palate, squinting, and harelip. So did Bigelow; in America, in general, the locomotor apparatus with all its ailments was included in the domain of orthopedics. English specialists comprehend under that name largely the defects of limbs due to congenital or acquired maldevelopments, to the exclusion of the diseases of the joints and bones. Volkmann and Hueter, and the Germans generally, include the diseases of the joints, and contractures. Amongst their remedies they count massage, gymnastics, Swedish movements, and the German "Turnen." They protest only against one thing, namely, the separation of orthopedic surgery from mechanical orthopedics. Indeed, the latter has tried to set up for itself under the leadership of a very ingenious and successful mechanic, whose head, swelled by the loud appreciation of some of the best men of the professional specialists, should submit to some orthopedic treatment.

It is not possible to know everything. You are no German Emperor of whom his Berlin subjects say that the Lord knows everything, only the Kaiser knows it better. You need not consider yourself a mere distributing agent of your patients amongst specialists, but there are always cases of whom neighbors of yours know more or whom they treat with more dexterity, to whom you wish to transfer your patients or whose consultation is desirable. Since there have been superior men amongst us who do surgical work exclusively—by the way, Fred Lange was the first among Americans to cut loose from general practice—surgical results are better. It is true, however, that antiseptics and sepsis date from the same period—scarcely thirty years ago. So it is with ophthalmology and other specialties, the exaggeration of misdirected enthusiasm

notwithstanding. Into its consideration I shall not enter long. The day has only twenty-four hours in this town. I may be permitted, however, to say that many turbinated bones and many ovaries were not meant to be kept in a jar. Those who have been in practice know it, those who will be in practice are invited to keep their eyes open and **their judgment undwarfed.**

Specialization in medicine is no longer what it was in old Egypt, namely, the outgrowth of the all-pervading spirit of castes and subclassifications, but as well the consequence as the source of modern medical progress. It is difficult, however, to say where specialization ends and over-specialization begins, or to what extent specialization in medicine is the result of mental and physical limitations or of the spirit of deepening research; or, on the other hand, of indolence or of greed; or whether, while specialization benefits medical science and art, it lowers the mental horizon of the individual and either cripples or enhances his usefulness in the service of mankind. For that is what medical science and art are for. José de Letamendi is perhaps correct when he says that a man who knows nothing but medicine does not even know medicine. What are we to expect, then, of one who knows only a small part of medicine and nothing beyond?

There is nobody, however, who can know all the various specialities or practice them. Seneca said 2,000 years ago: "The man who is everywhere is nowhere"—nusquam est qui ubique est—but we should know enough of them to appreciate their relation to the entire organism and to medicine. Those who mean to practice a specialty I advise to go into general practice first, private and dispensary, and build up in later years a specialty on the strength of their general knowledge and attainments. Those who expect to obtain a reputation and riches out of premature limitations, will obtain no success. That they could not reach distinction in their own profession goes without saying; for those specialists who enjoy the confidence and respect of the profession, have worked hard and long and are known for their general and broad information. Such men we appreciate, admire, and should imitate.

They need not be epoch making, but in the small circle of their acquaintances they cannot help being elevating and improving. They may be stars of the second rank, still they are stars. Amongst those of the first rank, those to whom Emerson wants you to hitch your wagon, I shall present to you a few:

Adolf Kussmaal was born in 1832 and died in 1902. He was professor in Erlangen, Freiburg, and Strasburg. His specialty was the practice and the teaching of internal diseases. His writings are pathological and clinical. They extend into pathological anatomy, diagnostics, therapeutics, gynæcology, surgery, pediatrics, neurology, psychiatry, toxicology, forensic medicine, and epidemics. I shall give you a few titles: "The colors in the fundus of the human eye," 1845; "The effect of circulation on the movements of the iris," 1856; "Epileptic convulsions during hemorrhage," 1857; "The absence, atrophy, and the duplication of the uterus," 1859; "The psychical life of the newborn," 1859; "The treatment of the dilatation of the stomach by means of a new method," 1869; "The disorders of speech," 1877; and scores of others on periarteritis nodosa, diabetic coma, etc. As late as 1900 he published a paper on the effect of the prolonged administration of digitalis, doubly interesting to me personally because his experience tallied with the results I had published during the preceding twenty odd years. Thus, indeed, he was a stranger to nothing medical: universal in his knowledge and his interests, a vast mind and warm heart, and an example of virtues and usefulness hardly ever met except in a superior physician. Those who read German should not fail to read his classical reminiscences of the young years of an old physician. It is replete with the history of a great time, of wisdom and poetry. It is mainly, however, his employment of the stomach tube in gastric and intestinal diseases that has made him famous over both hemispheres. Not infrequently a great man is remembered by some small things, not by what he would value most.

It is not his fault that rash practitioners have succeeded

in perforating an œsophagus, or in causing an ulcerated stomach to bleed. Now and then a gastrological specialist or a specialistic gastrologist may have found more satisfaction than the patient in the regular office introduction of the sound without appreciating the facts that hyperacidity was only a symptom and not a disease, but much therapeutical wisdom or morality is not displayed by that procedure. It is a satisfaction to know that even much enduring babies are not so frequently as a few years ago exposed to the inquisitive zeal of the professional pediatrist.

A specimen of what has often been called a specialist in the diseases of children was Carl Gerhardt (1833-1902), since 1871, when I met him first, my friend until he died four years ago. He published (1861 and after) several editions of a wonderfully learned and at the same time practical and concise text-book on the diseases of children. He was the editor of the great manual of diseases of children which appeared in seven volumes, 1877, and during a course of nearly twenty years; and placed pediatrics in Germany on a sound footing. Thus he was the predecessor of Keating in America, and Grancher and Comby in France. If anybody could be called a specialist in the diseases of children his was the claim. But he was the professor of medicine, the general clinician in Jena, in Würzburg, where he succeeded Bamberger, and in Berlin in the chair vacated by the death of Frerichs. He wrote on the location of the diaphragm, the diseases of the pleura and of the larynx, on croup, and many other subjects. One of the best books on auscultation and percussion in any language is his. He was perhaps the most expert laryngologist in Germany,—indeed, was one of the first to utilize the laryngoscope for extensive special work. He labored to recognize the paralysis of every laryngeal muscle, of every pair of muscles, of groups of muscles in their results on the voice and on respiration; also the consequences of the paralysis of one or both recurrent nerves, one or both superior laryngeal, and finally the functions of the fibres which originate in or pass along the vagus and accessory nerves. He was

the first to diagnosticate, while its extermination was still possible, the cancer in the larynx of the unfortunate and Mackenzie-ridden Crown Prince of Germany. He was a perfect chemist; the iron chlorid test in glycosuria is named for him, not by him—for he had the righteous simplicity characteristic of a really great man—and was none of the strenuous gasometers replete with pompousness, promises, and inconsistencies we may meet in science and politics. He was a physican looking for the ends of medicine, which are the cure and prevention of disease. The recommendation of sodium borate for adiposity—gentler and less dangerous than the much-abused thyroid preparations—is among his last publications. Facing the preface of my "Therapeutics of Infancy and Childhood," there is this dictum of Gerhardt's: "Healing is a fruit that grows on the tree of knowledge. No rational therapy without diagnosis. Examine, then judge, then help." This so-called pediatric specialist was the ideal scientific physician and teacher.

The grandest, however, of all the gigantic intellects, and at the same time a humanitarian of the world-wide horizon, was Rudolf Virchow (1821-1902). His is a new era, that era is created mainly by him. You know of his hundreds of epoch-making writings, of his tumors, his cellular pathology, and his Archiv, which has reached its 188th volume. In the history of our profession, aye, in that of mankind, there is no man in whom a vast intellect was blended with a warm heart to a greater degree. If proof were required his correspondence with his parents would furnish it (published by his daughter, Marie Rabl). There never was a greater statesman in our ranks. At the age of twenty-eight years the Prussian Government sent him to Upper Silesia to study the petechial typhus which was devastating the country. In his report he pictured its nosology and pathological anatomy as had never been done before, and also its etiology, viz., the government neglect of the inhabitants, which extended over centuries, their poverty, ignorance, filth; the economic subjugation both by the Prussian bureaucracy and by the effete feudalism. He urged medication and

sanitation, but more eagerly social reforms, culture, liberty, and comfort, unlimited democracy, education in public schools, agricultural institutions, care and education of the numerous orphans, building of roads, and the general recognition of the fact that, as he expressed himself, "our century is the beginning of a new social era." What happened? Was he applauded? Decorated? Rewarded? In accordance with Prussian methods he was deprived of most of his public positions. Then, in the first number of a new journal, he said: "The physicians are the natural attorneys of the poor, and the social problems should largely be solved by them"; and in the last: "The medical reform we contemplated was to be a reform of science and of society." With this early programme he filled his rich life. Whatever concerned men, present and past, that he studied and revealed—the sick, the dead, man both historical and prehistorical; man as a social animal, in the municipium, in the state, on the globe. Modern anthropology has no more fertile contributor and founder; and archæology was greatly benefitted by his studies and travels. The contemporaneous human bee-hives of the whole world roused his warmest interest. He addressed hundreds of popular meetings, edited a thousand popular essays, looked after the sanitation of schools and civic and military hospitals, made Berlin a healthy city, and in parliament aided the liberal movement in Germany. There never was a man who more than he deserved the hatred of a few scoffers—amongst them of the coarse, brow-beating Bismarck—and the admiration of his native land and all mankind. The number of his works, large and small—all great—exceeds three hundred. A few titles besides those I have mentioned must suffice: "The unifying efforts in scientific medicine"; "Fibrin"; "Colorless blood corpuscles and Leukæmia"; "Thrombosis and Embolism"; "Gynæcology"; "Conditions of the newly-born"; "The Pathology of the skull and brain"; "Crania Americana."

This greatest of all pathologists was a great archæologist, anthropologist, and statesman—was a statesman in this also, that he recognized and proclaimed the aims of

medicine to be scientific healing. It may not be generally known that for a long time he directed a ward in the Charité Hospital. His handbook on pathology and therapeutics, written by himself and a small number of select men (1854-1862), contains in its volumes everything that was known half a century ago, and much more that was new, and much that will stand for all time. He was the biological seer, knowing all and predicting more. His like we shall not see again, perhaps need not see again, because men endowed with high talents will do enough when building on his foundations. Consider his life and his work, and tell me of a specialist like him. Those who call him a pathologist and not much more, miss the lesson to be learned from the brain and heart of one of the greatest of men. If you doubt the possibility of reaching him, I may agree with you. But next to reaching his height, is the desire, and zeal, and good will to imitate him.

And now I want to refer you to an American specialist, a surgeon. That surgeon was Ernst Krackowizer. After having served the Vienna University with all his brilliant powers, he served his country against the absolutistic and reactionary government. He had to flee from Austria to save his life; the venomous persecution followed him all over Germany; he arrived in America in 1850. His public spirit induced him to start a medical journal through which he meant to influence European medical opinion. In a letter addressed to the transatlantic profession, he warned against the tendency at that time, with some even at present, prevailing in Europe, to underrate the position and merits of the American profession. While admitting the fact of our inferior opportunities and our disadvantages, and the further fact that most of our colleges were private, and not always first-class institutions, it is urged that the very competition of the colleges has a tendency to improve their status. The letter closes as follows: "I have no doubt we shall soon have State Universities, which will have nothing like European compulsion, but will be free institutions for the most advanced instruction. In this again, the natural self-development

of the American spirit exhibits itself. It begins at the base and culminates above. The political powers in Europe were interested in having ignorant masses and a few learned men; for that reason the universities were older than elementary schools. These latter had great pains in getting started. The universities organized elementary and higher schools on their own system and perverse principles. But in America, people thought first of initiating a general popular instruction; they cared not so much for learned individuals as for a cultured people."

Much of his time and labor was spent on public institutions. He was one of the surgeons of the Brooklyn City Hospital, the German Dispensary, later of the German Hospital; of the Mount Sinai Hospital, the New York Hospital, and in 1874 and 1875 in Bellevue. Here he resigned on account of what he considered and publicly proclaimed as the faithlessness of the board of governors, who after having solemnly bound themselves to organize the great institution on the lines proposed by the medical board, broke their promises at the first opportunity.

While he studied and recognized man as a link of all creation, he revered medical science as comprehensively connected with all scientific facts, no matter where found and whence collected. Thus, while he was eminently a humane and a practical man, in order to be so he was erudite, in the full meaning of the word. It was the erudition of his which proved one of the principal charms in his medical career. He was conversant with medical science in almost all its branches. Thus every word of his, when he participated in a discussion, was fraught with solid contents. He was one of our best pathologists. His counsel was sought in medical cases as in surgical; in practical politics of the city and state as in practical medicine.

In his views he was universal. He was just as removed from looking on medicine as a business as on a tissue of conjectures or possibilities, or a merely sentimental vocation. He was as well acquainted with the history of medicine as with the anatomic and physiologic points of a diagnosis, for the embryology of medical science was

of as much importance to him as that of the human being. He thought just as little of men who did not care for the fathers of medicine as he would have thought of an American who did not know the fathers of his country. For George Washington and Jefferson are of no vaster importance, politically, in the history of the world, than Harvey or Bell in that of medicine.

When he died, and after his death, I have often wondered which six men in the profession could or would fill the place he left vacant. H. B. Sands was as good a surgeon; W. H. Draper was as eloquent, as classic, as erudite; Alonzo Clark was as elegant and as full of knowledge such as Anglo-Saxons had furnished to the medical profession; Austin Flint was as painstaking and industrious, —but who was there with as wide a horizon, with absolute impartiality, who to equal his eagerness, to give his time and means, and strength, to the service of the profession, the community and mankind, his harmony of brain and heart, and his wonderful unselfishness. He was, and was called, a specialist with all that. Go, and do likewise.

MONISM IN MEDICINE

Now that I have partaken of your dinner and enjoyed my neighbors and, I beg to apologize for becoming personal, the atmosphere of my surroundings, I begin to doubt whether I am in my proper sphere at all. Still I mean to have and to hold the floor, but not long enough to make you wonder why I do so. After all, however, you will have to be satisfied with fragments, since I have found that for lack of time an ample exposition of what I mean by monism in medicine and in the profession should not perhaps have been undertaken at this occasion. Still, as there should be *nulla dies sine linea,* so there should be no meeting of scientific men without some serious purpose, for life is short and opportunities are fleeting.

You understand me when I say that you and I as men and as medical men are ten thousand years old—we are twins, brothers, equals, call it what you please. The prehistory and the history of the world, unpleasant as it has been sometimes, and the reverse of ideal, has been from century to century an evolution in the direction of civilization and culture—which it may be said, many, after all, look upon as still barbarism. As medical men we stand on the shoulders of our ancestors; and we, from immemorial time on, belong to a family whose younger members enjoyed the results of previous experience or labors, and then again left to their successors untold problems. I see monism, or at least a monistic tendency, in all that has gone before in the history of the world of medicine; I see unification, union working to a common end, monism as the underlying, unconscious power.

There is, however, no such thing as an unbroken progress. Progress is interrupted by relapses. Even great revolu-

tions never reach the end aimed at. Look at the great French Revolution, beginning in 1789, the German Revolution of 1848, and our own abolition of slavery. After each there was a period of reaction which threatened to do away with all the results of each of the great convulsions. To its full extent, that is fortunately impossible. No Bourbonism in politics and science was ever entirely successful. You might as well try to undo the results of a volcanic eruption. But every progress, whether obtained gradually or eruptively, leaves an improvement upon former conditions. Even stealthy peonage and anti-negro barbarities are better than legalized slavery, for during the latter everybody —the whole body politic—was criminal; the former are upheld by a minority only.

As an example of a gradual, though ever so slow evolution in the direction of union and monism, medicine stands foremost among the composite sciences. In antiquity we meet simply empiricism, soon combined with and preempted, as it were, by priesthood. Even Machaon, in Homer, was a priest; the Egyptian physicians, numerous specialists for every part of the body included, were laymen. The old Jewish healers were priests; the main healing places of the Greeks and Romans were neither dispensaries nor hospitals, but the temples of the gods. That is why now and then a patient of yours will tell you,—even in the twentieth century—that after God he has confidence in you, as being able to give him calomel or cut his carbuncle. The priesthood, according to their privilege or business, introduced into medicine mysticism, superstition, and miracles. In that respect the priesthoods of all ages are alike. Unfortunately, the crystal-like clearness and directness of Hippocratic thinking and teaching were counterbalanced by the dualistic philosophy of Plato and Aristotle; these two influenced the medicine of mediæval periods in spite of the teaching of the Arabs who had inherited from the school of Kos and Knidos. Plato and Aristotle controlled medicine for nearly 2000 years. Their dualistic philosophy, continued by Descartes, was the exact thing to suit both church and state, which relished nothing more keenly than the breaking up of the human organism

into body and soul, into the pestilent carcass and heaven-born spirit, and the absolutistic ruling of the material world through the plea of taking care of the future of the soul. It is not forty years since the Superintendent of a Foundling Asylum to whom I spoke of its 100 per cent. mortality, told me: "You know, Doctor, we care more for the souls than for the bodies." Another little example of modern times, teaching the calamitous influence of positive religions upon medicine is the following: When the great surgeon, Dupuytren, had an empyema, he was told to have it opened, and he replied that he preferred to fall into the hands of God rather than that of man. So he did fall into the hands of God in the year 1835, only 57 years old. Mind, that was in the nineteenth century, when the hands of Lænnec's successors, Andral, Piorry, Louis, could have been had for the asking.

The medicine of every period of history is sure to filter slowly into what euphemistically is called the brains of the lay community. The medicine of past centuries reappears in the popular medical creed of the people of the present time. That is why you have to meet amongst your patients the beliefs we have outgrown in the healing powers of human urine, or of the water of amber, made by Paracelsus out of cow dung, or the infinitesimal dilutions, or —what is not much better—in the ubiquitousness of diseases attributed to worms and dentition. It is not long since what is called Christian Science, witchcraft, and the evil eye, have disappeared from the etiology of both doctors and some laymen.

Things began to change in earnest when biological methods were introduced into the study of medicine, mainly by Virchow in Germany, when France had to give up its superiority established since Bichat. It was still the time, however, when they, or rather *we,* spoke of national, Anglo-Saxon, French, German medicine. Without going into particulars, I simply direct your attention to the Homeric laughter that would burst upon you if someone would speak of German or French physics, or chemistry, or Anglo-Saxon astronomy, or geology. If at present we should speak of national medicine we should merely admit

that we do not recognize the legitimacy of the position of many parts of what we call medicine amongst the exact sciences. In twelve special sections the Congress Committee of the St. Louis Exposition has acknowledged that position, and elaborated the relation of medicine and medical specialties to other sciences and arts. That is an achievement which it behooves us to appreciate. Nor is it inappropriate for us to enjoy the new feature of American thought which created this great new departure in behalf of practical philosophy. Exact science is no longer national, it is international, cosmopolitan. Besides, like the pigeon-holes of our brain, which store individual knowledge and are connected more or less with association fibres, so the sciences of the world are working in special directions and find their connection in philosophy.

The increase in medical knowledge caused by the introduction of the new and natural method into the study of medicine appeared to be replete with dangers, inasmuch as it created new specialties and the tendency to disintegration of the body medical. No doubt many specialists and practitioners lost their contact with medicine as soon as they embarked in business routine. There *are* men whose hearts are enshrined in their pocketbooks and whose brains are occupied as custodians of their bank-accounts only. But the increased facilities, instruments of precision, and deepened research of specialists have vastly increased general medical knowledge and facilitated, not hampered, the establishing of medicine as an exact science. It is due to this deepening of research, indeed, that the domain of medicine has increased instead of narrowed. With you it may be a personal mood or impression either to approve or disapprove what I have said. All that may be the matter of experience. Please do not forget, however, that as there are doctors and doctors, so there are indeed specialists and specialists. When a young man carries Jæger's test types sticking out of his outer breast pocket, or exposes a brand new microscope at his window, or tells the trolley passengers—while looking at you—of his last abdominal joy, you know all about him; he is either vain or after something. But there is another class—you know

when you see it, because you meet it quite frequently. The strutting of immature special workers that never had a taste of the difficulties of practical medicine but buried themselves behind a small row of test-tubes armed with sterile cotton near a single microscope in front of a window with northern exposure should not at once lead you to condemn their work. They are no experts or adepts in medicine, but still they may be able to furnish, or contribute to furnish, the stones required for the erection of the sacred temple of modern medicine. *If* they wear blinders they should not disappoint you, nor do they indeed narrow *your* horizon. Full-grown modern bacteriologists have already ceased to look upon themselves as the only makers of modern medicine; organic chemistry has slowly forced itself to the front; and please do not forget, when you feel offended with the superciliousness and self-complacency of the *immature,* that it is not everybody that can become a Theobald Smith. Let us be patient. I hope there are some general practitioners like myself around this table. Please do not be offended when I say that as there is no *alter ego* for your Theobald Smith, even you and I perhaps are not so big as we think we are—possibly there is no Osler, no Councilman or Welch, no Clifford Albutt, no Gerhardt among us. Maybe I am mistaken. If I am, it is not the first mistake I have made. Please excuse this one on account of my youthful inexperience. At all events, do not blame bacteriology for the sins of some few workers.

To specialistic labor we owe the fact that many branches of science which formerly had no contact with medicine—or a very late contact—are now recognized as its intrinsic parts; for instance, modern hygiene compared with ancient or mediæval hygiene. Amongst ancient people hygiene was part of their religion. Gods were credited with sanitation. In Egypt, animals that contributed to the destruction of injurious conditions were adored as gods and demigods, others that were injurious and therefore feared were also adored—*tout comme chez nous.* Even Hellas and Rome, that knew how to build aqueducts and to improve swamps, connected hygiene with divinities. Mediæval

Christianity believed and acted still worse. Terrestrial life was despised by the spokesmen of the church and valued only as a preparation for heaven; the body was a receptacle, or, what is worse, a prison, of the immortal soul, and therefore, a negligible quantity. As diseases were evil spirits, so epidemics were treated with prayers, processions, and the killing of doctors and Jews. Now it is fondly believed that we have advanced to a condition in which common sense is combating the dicta of what is mistaken for religion, and the scientific study of air, water, clothing and social improvements, makes hygiene a part of medicine, and even teaches the economist and humanitarian that what is good for the poor is so for the rich, and vice versa. Aye, we have progressed so far as to convince the rich that, out of sheer selfishness, they must keep infectious diseases from their poor neighbors if they mean to preserve the immunity of their own premises. They have begun to learn that diphtheria, and smallpox, and scarlet fever are persistently and irrepressibly democratic and no respectors of millions. I can imagine that every such proof of natural and social and sanitary interdependence will accomplish much of what the refined socialism of modern times has inscribed on its flag, will foster the sense of solidarity amongst the several classes of men, and lead to monism as the future ideal structure of human society.

The vitalism of biologists has made us believe that there is a natural science of the body and a science of the mind. Psychology was the latter; physiology, the former. There was a therapy of the body and one of the mind. Mental diseases were demons which required exorcism and expulsion; or they were criminal conditions which must be punished. As late as 1792, Pinel, with the sanction of the revolutionary convention, began to break the chains of the insane. In this, as in many other things, France led the world. Less than fifty years ago my old friend, Bräunlich, who controlled a large lunatic asylum in Saxony, taught in this, our country, that mental disorders must be cured by prayer and persuasion. We know now that anatomical or physiological alterations of the cortex are responsible for mental aberrations, as those of the heart or

lungs, or the medulla, must be credited with causing dyspnœa.

Anthropology is at present recognized as the science of everything belonging to man. Hæckel proves it to be a part of zoölogy. We, heading as we do, the empire of mammals, have learned that the chemical and physiological properties of tissues, the laws of physics, and the rules of heredity are common to all. Thus, indeed, while knowledge increases, we are tempted even to-day to subsume medicine under anthropolgy.

All this proves that the disjecta membra of medicine, and of science in general, have an uncontrollable tendency to a strong union, to monism. Even the science of language belongs here. Language is recognized as a function of the organism. It is, in its various forms, common to man and the other animals, and differs only according to races, social surrounding, and the structure and location of the centres of articulation.

Gentlemen, I understand that I am speaking to graduates of several New York Colleges. I prefer that by far, to meeting the pupils of a *single* school. Not that I have any fault to find with the heartfelt attachment of a man to the institution that educated him. On the contrary, I love his sympathy with his intellectual or professional mother, as I sorely deplore the occasional absence of family feeling. That is why I heartily approve of societies of alumni, particularly when I feel certain that they are founded for more reasons than mere gregariousness, or for the purposes of warm friendliness, as long as it is not contaminated with jealousy. I say this because it has often appeared to me that many of us identify the friendship of a narrow circle with the estrangement from the members of other contingents. I have seen too much of such exclusiveness not to fear it and to condemn it. Unfortunately both blind friendships and estrangements follow some men—small men, it is true—through all their lives. To belong to a small circle in professional life, and nothing beyond, numbs the sense of justice or equity. The acquisition of small or big places and preferment of all sorts depend too often not on the principles of a pure

civil service, on merit, on ability, but on alma mater, or family, or position, or social relations. If the reverence for one's alma mater can bear *such* fruit, it would be better not to belong to *one* school, *one* narrow circle. Indeed, I believe that the custom of German students to change their universities once or twice in three or four years has contributed a great deal to facilitate a certain degree of union in their country.

Mind, I do not speak from any personal reasons nor from any knowledge of you or your doings, or of Boston or Massachusetts conditions, and certainly not for approval or applause. I am just as willing, as long as I express my conviction, to displease as to please. It is quite possible that what I say may not be considered to be even fitting here or for this occasion. As far as I know, you do not belong to a single alma mater, but come from the different schools of New York City. I should like it still better if you would include in your association all the schools of New York State, or, for that matter, of other states. There is no commonwealth or no society in which the men of Ann Arbor, or Jefferson, or the University of Pennsylvania, or of Virginia, or of Illinois, should not find a warm and appreciative welcome. A real University Expansion would be called the mutual recognition of all the representative institutions of the broad land, and the dropping of the spirit of narrowness and of secession in the domains of intellectuality. These, my own eyes, have seen a regiment of soldiers consisting of the flower of Massachusetts—the very vanguard of unionism—marching through New York and Baltimore to fight the serpent of secession, which unfortunately is not quite dead yet. You have heard of 1861, and of John Brown, and of Father Abraham. It behooves the professional youth of this very state to look beyond the narrow boundaries of a school, of the schools of a state, to all the schools of the whole Union, and not *the schools only*. You are no longer attached to a school, but are citizens of the profession, just as you are, though Massachusetts men, citizens of the Union. The medical profession is a state in a state, *must be* a Union in the United States. When State Medical

Societies were formed, *they* were not narrow conglomerates, but consolidations. A state at *those* times was as big, and the distances as great, and the interests as varied, as those of the Union *to-day*. The profession at those times was represented in the State Societies. It now takes the American Medical Association as it is preparing to become, to really represent it. There is only one great association at present that verily represents what I believe to be the medical aristocracy of the great country, *viz.*, The Congress of American Physicians and Surgeons, which never excluded any candidate reaching up to its standard from any state near or far.

Those of you who are acquainted with the professional affairs of the country may feel like rebuking the old New Yorker for the condition of medical affairs in his *own* state. It is true there has been discord there more than twenty years,—indeed, since that very year in which I had the honor of being the President of the Medical Society of the State of New York. Without going into particulars, let me say that the discord and contests were the results of differences of principles. The wisdom of the American Medical Association has finally smoothed the path for unification,—and the legal obstacles in our way, and narrow-minded sticklers and personal animosities notwithstanding, —not only unification, but genuine union there will be in New York State. For 99 per cent. of our medical profession have ratified the agreement for consolidation, and within a reasonable time ten thousand medical men of the Empire State will rally around one flag, and that flag will be that of the American profession.

Why do I say all that? Why, I know of nothing better to say. I know of nothing better than the concord, the co-operation, the unity of the medical profession. *There is* monism. When it will be one there will be no greater power for good in this land of all lands. Believe me, I have been with all my heart, while mourning, engaged in the fight that had to result in discord, but for twenty years I looked forward, and for years I have worked for the peace and concord we shall soon reconquer. Why do I say it *to you?* I would tell it all over. You are

young and yours is the future, and in your keeping is the future of the American profession. Mind now and forever, honesty of purpose, a common aim, and the altruistic labor in the interest of all have always been the greatest satisfaction and also carried with it the sure reward of the sincere and strong man. It may not always seem to pay; sometimes in terrestrial things it does not; but if there is to be smallness, or injustice, or jealousy, let them *not be yours,* leave them to the small, or unjust, or jealous on the other side. Really, I do not know about Boston affairs, but one of your city expressed himself lately in New York in such a way as to make me think, or fear. On October 18, the second day of the year's meeting of the New York State Medical Association, Dr. Withington, the delegate from the Massachusetts Medical Society, said, among other things: "I am very glad that the amalgamation is as far advanced as it is, and I understand now that the law's delay is the only thing which stands between you and union. We are not so well off in Boston, for we have two absolutely identical institutions doing the same work, and refusing to see the manifold advantages which would come from a union. I do not know that I would venture to allude to this in Boston, but I think that I may possibly do so here." That is printed; that is why I quote it.

I can only say that two institutions, if, or when, identical, should find little difficulty in uniting. *Our* difficulty in New York State was that these twenty years there was no identity of principles and purposes. As soon as that was restored, union became possible. You are many, and every man has influence; see that discord and secession have no lasting place.

Monism has a better chance to be the rule and guide of medicine and the medical profession all over the world than, for instance, of *jurisprudence* or *theology.* The former is national and will remain so as long as the race is divided into nations; the latter is chained to its original dicta,—it cannot exist and remain powerful unless it insists upon its immutability. That knowledge and the obedience to that fact has underlain the power and relative invincibility, and aggressive force and expansion of the

Catholic Church, and the stability of orthodox Judaism these two thousand years. Theology or theologies that submit to changes of canons and adapt themselves to circumstances or changes of mind, cease to be what they were. The multiplicity of theologies in our United States is not a symptom of strength, and reforms are seldom natural evolutions, but are mostly the outcome of doubts and forced adaptations to new surroundings or circumstances.

Medicine and the medical profession are situated differently. Medicine rests on nature, its study is the methodical study of nature. *There is* the realization of monism. The medical profession of the whole world has the same scientific, moral and social interests. Systems and sects, fads and un-Christian clap-traps have no place in it forever more.

Municipal and political life was the result of the necessity of individuals who clubbed together for mutual self-help, which Kropotkin, who mistakes himself when he calls himself an anarchist, declares a more powerful instinct than mutual contest and destruction. Municipia, villages, townships, towns, counties, states, the Union, are recognized as self-evolving necessities. They were not made, they grew,—very much more so than may be said of foreign states or governments, in whose formation individual egotism, force and violence were all powerful.

Inner necessity created our Union; there is no reason why we should not look forward to the realization of what has been declared the vision of dreamers. Our Union was formed because the millions inhabiting the states had among them a sufficient array of common interests that bound them with ties stronger than steel. When the interests of all nations of the globe become uniform and strong enough, the Hague tribunal and arbitration courts will be considered the first beginning *only of* universal union and of good general will on earth.

Again, the medical profession is more favorably situated than mankind as a whole. It gathered in town societies, county and state societies, in the American, British, German, French, Italian, etc., Medical Associations, and in the Congress of American Physicians and Surgeons, in

International Medical Congresses—without any difficulties, and was rewarded by the applause of the world. And why could that happen? The aims of medicine and the interests of the medical profession—no longer professions —are the same all over. The interchange of knowledge, the encouragement of study, the improvement of methods, the prevention and cure of disease, the stamping out of epidemics, the regulation of quarantine, the sanitation of dwellings and cities, the hygiene of schools—both physical and educational,—the reformation of the principles of pedagogy, the purification of the moral standard by invigorating the young body and increasing the resistance to sexual and other temptations, the scientific study of the cerebral functions in the interests of a humane jurisprudence and legislation—for indeed the ignorance displayed sometimes on the bench makes criminology look too often like criminality—all these are or should be recognized as the responsibilities and duties of the medical profession, not of this land only, but of the lands of the earth. No political estrangement, not even wars that may be mitigated by the Red Cross, can ever change all and every one of these duties and responsibilities, for they are indelibly inscribed on the flag of the medical profession. *There is monism.* Old and young, the learned and the beginners, practitioners and specialists, the laboratory experimenters and the bedside workers, the leaders and masses, the teachers and students, they may all strive and fight, not in war, but in harmony, on the same field of honor; and no victims, no enemies shall be left—except ignorance, or the dangers caused by nature, or the incompetency of human structure.

EXILE AND DRUGS IN THE TREATMENT OF TUBERCULOSIS

My remarks will not be academic nor learned. They are meant to be practical only, aye, homely. We have undertaken to fight in tuberculosis an ugly reality, a preposterous anachronism, and may succeed in decades to come with the aid of the thousands who admire or wonder at your exhibits, and of the millions beyond.

Well-to-do or rich people, when tuberculous, are comparatively lucky. Leaving their doctor behind, they may feel inclined to follow part of his orders. A well-directed sanitarium, an equable climate, the South, the Riviera, Egypt, even the Adirondacks are open to them for years, and Greenland is promised. But the vast majority of those inflicted with tuberculosis of the lungs are tied down to their farm or farm work, their factories, their trade, and their poverty. It is that numberless army of anxious, dissatisfied, hungry, cheerless or woe-begone faces that crowd into your offices, dispensaries, and scanty sanitariums and peer into your eyes for help and consolation.

In this audience of practitioners I may be permitted to divulge one of the many occurrences in a doctor's office. Among my patients, many of whom apply a single time only, are a great many that are afflicted with pulmonary tuberculosis. They will come in any stage, incipient, advanced, moribund. All of them have seen one or half a dozen practitioners, or more, and many have been in half a dozen dispensaries, their hope and lack of confidence driving them from one to another. They have been percussed and auscultated, their sputum has been examined and declared positive by the Health Department, or otherwise. Their diagnosis has been made for them. They know they have either "tuberculosis" or "consumption." When they struck a doctor who recognized a human being in the forlorn creature before him they were told they

had tuberculosis. When they addressed a young colleague, an immature colleague, a colleague satisfied with and gratified by the possession of a diploma which is as good as yours—or better, because it is so new and yours is so old—and who likes to exhibit his knowledge and his authority, they were told they had "consumption." The hollow eyes and longing looks betray the fear of impending death, for many have been told that nothing can be done for them. A hundred times every year they ask me: "Have I consumption?" the affirmative answer meaning a death sentence, and a hundred times they hear from me this answer: "You have tuberculosis. If it were to get worse it would run into consumption. But cases of tuberculosis may and often do get entirely well, so there is no reason for despair."

Now and then there is among them a worn-out school teacher or her embryo, the Normal-school girl, with no breakfast except a cup of black so-called coffee and a cracker—most of them, however, are working men—many at work, many out of work and not able to find it because their cough and spitting seems to betray them. You know all about them. It is true they do not spit like subway employes, or trolley and "elevated" conductors or gate-keepers, but they have to cough and expectorate some. They cannot help disseminating bacilli, for neither in factories nor sweatshops, neither in subways nor on elevated platforms are there any spittoons in this city which says she is bent upon exterminating tuberculosis.

They are poorly fed and clad, and without sufficient opportunities to keep clean—for they are without means.

Now look for the advice given them that is to work their salvation. Time and again a woeful-looking man will tell me after I have assured him he has tuberculosis and need not run into consumption, that his last doctor—I have many names on my roll of dishonor—has told him to leave the city at once; that unless he leaves for Colorado at once he must perish. Very often I ask the following questions: How much money have you? or your family? or your friends? Has your doctor who told you that you must leave at once also told you that he will pay your rail-

road fare or support you? How long do you expect to stay away? Is your society, which you hope will contribute to sending you away, ready to give you at least $10 a week for at least half a year or a year? or has some one work for you by which you will be able to live? Have you heard that patients like you starve and die in Colorado because the good people of the State and its cities are unable to support the thousands of arrivals? Have you been informed that we doctors in the East have for years past been warned and requested not to send them any more such patients because they may die in the streets? What has your doctor done for you? Have you taken any medicines to relieve your cough? Do you do anything for your night-sweats? Has your constipation been relieved?

It is not necessary to tell you how many "Nos" are received in answer to these questions. As for me, everyone of these cases sickens me. Not to speak of the coarseness and cruelty of the medical oracle enunciated "ore rotundo" to the individual under such circumstances, it is pitiful to think that in the ranks of the profession there are men thoughtless and reckless enough to crush the sick creature by asserting the utter helplessness of his condition.

I claim that starvation in Colorado is not more wholesome than insufficient and improper feeding in a New York rear room; also that the air of a small Colorado attic with no window—or an insufficient one—and closed door, is no better than a tenement dwelling on the East Side; also that a patient fed by his friends, even in the lung block of Cherry Street, with occasionally an open window, is better off than a similar patient starving, without a pitying eye to look at him, in a rear attic or in the streets of Denver.

That seems self-evident: not, however, to your New York colleague who, while ordering impossibilities, scatters the last hope of a fellow-being. Most of the patients of this class have families, or members of families, dependent on them. That is why they must be able to work, or work, though they were incapacitated. There are, how-

ever, a number of young men, not married, that have learned a trade. It is safe to send them away. I tell them to leave for a city south or southwest, where they can live and work with their windows open both day and night, and find occupation, and not to return, except on a visit, or unless they will have accumulated a competency.

Modern medical science and art, which have succeeded in appreciating the teaching that the best object of man's endeavor is man himself, have tried to utilize Nature in all her bounties. That is why treatment has become hygienic and dietetic in addition to having been medicinal only. As all our mental processes appear to encounter a certain limitation, the comparatively new appreciation of the wholesome influence of unpolluted air and unpoisoned water, and undefiled milk, has so overwhelmed our understanding as to make us forget that mercury, and iodin, and opium, and digitalis, and salines, and arsenic are as kind gifts of Nature as spring water, and desert air, and high altitudes. That is—not to speak of the ill use that may be made and has been made of medicines—why we are apt to drop the use of drugs from our considerations! That is why, nowadays, the treatment of tuberculosis is too often deemed to be exclusively a hygienic one. Open window in some shape or other, as dictated by either common sense or fad; fresh air at home or in a sanitarium, neglect of everything, unless or until you succeed in getting into a sanitarium, have, with many, become the rule. It is openly proclaimed—only to emphasize the dignity of hygienic treatment—that sanitarium treatment is the only one to be recommended. Meanwhile, you have one sanitarium bed for 30 sick. That oracular and unjustified conviction is expressed in the advice given to go either to "Colorado" or to perdition.

Nothing is more discouraging and less scientific. Experience teaches more practical and more humane lessons. This paper has to deal more with the cure of established tuberculosis than with its prevention. The latter, however, may prove beneficial in the hands of the physicians. The general practitioner, the family physician, has plenty of opportunities to make himself useful; indeed I fully

believe there will again be a time—and very soon, too—in which doctors will not be so scarce and lightly thought of as they are to-day, and will again be the trusted caretakers of families and the statesmen of the community. They are in a position to notice debility, insufficient metabolism and low weight and excessive growth, scrofula, tardy convalescence from infectious fevers among the children in a family, and to correct them. Their long acquaintance with the history of a family will tell them that when in one that has no history of tuberculosis, child after child develops some form of tuberculosis, to look after syphilis, and not to rely as a preventive and a cure on so-called antituberculous, but on antisyphilitic treatment. There are many families in which numerous young underweight children of from 3 to 10 years of age, or more, may be changed into robust or promising individuals. It is again the family doctor that has the opportunity of watching the diet, which should contain nuclein with the favorable influence on the formation of uric acid. He will see to it that an excess of fat will not cause gastrointestinal catarrh, that young meat and sweetbreads, eggs, milk, cereals, and fruit, with their proper percentage of iron, are administered in due proportions. He will thus cut into the practice of the lung specialist—whatever that may mean—but will raise a family of good-for-nothing people.

Another means, both preventive and curative, is the attention to the mucous membrane within reach. It consists of two daily irrigations—not sprays—of the nasopharyngeal cavities with warm (6 to 1,000) salt water to be made from a cup; an occasional spray of a 2% silver nitrate solution; and the resection of hypertrophied tonsils. When Beckmann (1904), however, prevents (and cures) tuberculosis, he does so by exsecting the tonsils according to a method which very few except himself—so he says—ever know how to follow. I am satisfied that if he were in America he would soon learn that he made a grave mistake in so advertising his opinion, himself, and his readiness to operate on all other people's tonsils in his own office.

It has become popular to deny the effect of drugs on

any abnormal condition. Because you cannot prove a cure by drugs in a given case of tuberculosis, you give up trying. In cases of pneumonia you are glad enough to speak of your cures. Still, you never actually cured a case of pneumonia. What you did was to arrange the hygiene, diet and medication of your patient so as to enable him to live until his pneumonia had run its full course into convalescence. By succeeding in this you really deserve all the credit of having cured your patient. Now by so arranging the hygiene, diet, and medication of your tuberculous patient as to enable him to resist the local effect of bacteric invasion and the systemic effect of specific and complicating toxins, and to give him rest, and to stimulate his cardiac and peripheral circulation, is to treat and to cure a case of tuberculosis. That is what you are doing by systematic gymnastic exercise of his chest and expansion of its congenital or acquired narrowness; by the daily use of cold water and friction which stimulate the circulation of the surface and of the interior, and thereby enhance metabolism; by insisting upon a copious supply of oxygen and the expulsion of noxious gases through open windows; by overcoming the prejudice against night air and teaching that night air is better than no air; and by a generous and digestible feeding such as the individual case will indicate, and, I might add, individual means will permit. For as long as the means of a hundred millions of Americans are squandered on thieves, and foreign conquests, and pensions, there is no money for the welfare of the people and the extinction of yellow or white plagues.

The wanton theory that you can treat with medicines and cure a pneumonia and typhoid fever, but not a case of tuberculosis, has taken possession of the oracular mind of the Colorado-ridden exile doctor. He should know better and do better. There is a drug treatment for tuberculosis, as for other diseases, and he should be glad to avail himself of it. There is no panacea, however, for tuberculosis, as there is none for pneumonia or typhoid fever. But there are indications, and improvement of conditions, and prolongation of lives, and recoveries.

TREATMENT OF TUBERCULOSIS

I read before the American Climatological Association on July 24, 1892, and published in the *International Medical Magazine* for November, 1892, "Notes on Guaiacol in the Treatment of Pulmonary Tuberculosis." At that time the history of that drug was a short one. Professor Max Schüller, of Berlin, recommended it in 1880; in 1891 he wrote a book, and his first article in Eulenburg's Encyclopedia in 1892. Some of his successors are mentioned in my communication. From 1880 to 1891 Schüller treated 90 cases of tuberculous disease. Four died, 70 were cured, 16 were still under treatment in 1891. Four doses daily were administered persistently for a long time—from 2 to 3 drops for children, from 3 to 5 for adults, in sugar, water, milk, meat broth, or wine —not in pills nor in capsules, for the undiluted guaiacol may irritate the mucous membrane. Injections into the subcutaneous tissue or the muscles he made only in cases of local tuberculosis, and in oil or glycerin only. It was given in enemas or in inhalations for catarrh of the pharynx, nose, and trachea. The remedy may be combined with expectorants, cardiac stimulants, antipyretics, and for inhalations with turpentine or camphor. Seclusion in rooms or sojourn in institutions was not insisted upon; it was employed in all conditions of life and occupations. Invariably appetite and strength increased—good appetite affords a good prognosis—expectorations became easier, cough less and looser, pus was replaced by mucus, and the results of percussion and auscultation became more favorable. A visible effect on the number of tubercle bacilli in the sputum was obtained after a long interval only. Many cases of so-called surgical tuberculosis improved and recovered without an operation, still, mostly local treatment and the internal treatment with guaiacol were combined. A good effect was obtained in scrofulous eczema containing bacilli, in caseous lymph bodies, and bone tuberculosis, A case of caries of the petrous bone complicated with meningeal symptoms got well after operation, with guaiacol. At that time no renal tuberculosis had been so treated, nor was tuberculosis of the testicle recommended as a safe subject for experimentation

Between the years of 1891 to 1899 he observed 200 cases of more or less localized tuberculosis, 37 of which were complicated with the same disease in the lungs. He adds that all of these were either healed or improved, and further that other preparations of guaiacol were inferior in this, that when he used them both for injections and internally, relapses were seen more frequently.

It will not do to deny these plain statements. Schüller is known as an honorable man, of high professional standing, of great observing powers and cool judgment. Nor will it become us to look on these cases as exceptional occurrences. There is no reason why everybody should not meet with the same exceptional luck in dozens or in hundreds of cases. Anyway, we are just beginning to look upon tuberculosis as a remediable and a curable disease.

My own experience is of a similar nature, and here it follows:

Most of the cases of tuberculosis I see in my office and occasionally in an out-of-door practice, are in the lungs. I rarely see incipient cases. Some of those, however, whose lungs are not sound are not cases of tuberculosis at all. There may be subclavicular or supraclavicular retraction, diminished or more frequently bronchial respiration, bronchophony, dulness, but no rales and no elevated temperature. This condition which may have lasted and will last a lifetime, is the result of an interstitial pneumonia or peribronchitis which, overcome in childhood, has led to permanent but no longer dangerous or injurious changes. I have described that conditions in *Archives of Pediatrics,* January, 1903, and in the third volume, second edition, of "Traité des Maladies des Enfants," by Grancher and Comby. I made this statement before you in order to prove that I am anxious to differentiate and to be sure of my diagnosis.

What I mostly see are cases of advanced tuberculosis, which have been under the observation and treatment of others. They exhibit dulness, rales, bronchophony, bronchial or cavernous respiration; many have copious expectoration of pus, blood, and bacilli; quite a number the elevated temperatures of bronchitis or mixed infection,

night-sweats, and emaciation. There is not a morning without one or more of such patients. When I say that I see 200 or 250 of that nature a year, that figure is rather an underestimation. That is why I am certain that during these last 15 years I have treated with guaiacol 3000 patients inflicted with tuberculosis of the lungs. The vast majority of that number was found in adults. Children with pulmonary tuberculosis are fortunately not numerous. In them the prognosis is much more unfavorable than in adults.

The doses I have used are a little larger than those employed by Schüller. A routine prescription of mine is guaiacol, 50; tincture nux vomica, 40; tincture strophanthus, 30; Fowler's solution, 10; a half teaspoonful to be taken three times a day after meals in hot milk. Very few people object to the taste. Some take it in cold milk, while they are at work and unable to procure hot milk, hot broth, or hot water. The above prescription is not expensive and is given to the poor or the working people. Those who can afford to pay for it take the guaiacol carbonate, from 2 gm. to 3 gm. a day, or a grain or more for every minim of the liquid guaiacol, mixed or not with spartein, and small doses of arseni trioxid—the modern pharmacopeia name for arsenous acid.

A very common prescription reads as follows: Guaiacol carbonate, 30° or 40°; strychnin nitrate; arseni trioxid, āā 0.1, spartein sulfate, 3.0; divide in 50 powders, three of which are taken daily after meals. This prescription is ordered for one or two months or for a half year. Many patients present themselves after a still longer absence. Strophanthus or spartein may be taken indefinitely, because they are rapidly eliminated. Digitalis, however, though the fear of cumulation is grossly exaggerated, may, when not taken carefully, have that effect, or may affect the stomach, or may be charged with causing disagreeable results, and the poor patient persuaded by consoling friends that drugs are hurtful, and that he has consumption anyway.

It is desirable to give a mixture of a number of indicated drugs, so long as they are not incompatible. It is

useless to make the task of taking medicines onerous. Many of your patients are in business and at work, and should remain there. So let there be a single dose, or a few single doses day after day, month after month.

Otherwise, in regard to digitalis, I wish to repeat what I urged upon the profession in a paper on "Arsenic and Digitalis in the treatment of Consumption," read before the Medical Society of the State of New York, in its session of 1884. Small doses of digitalis—that means for an adult from 3 gr. to 5 gr. of the herb daily, divided into three or four doses, or as many minims of a good fluid extract, or 1 to 1.5 gr.=0.1 of the solid extract—never the unreliable or inert socalled digitalin—may be given indefinitely for months and years. With a little circumspection, even old hearts and moderate chronic myocarditis, and advanced aortic stenosis may be treated with small doses of digitalis. Patients who take digitalis in this way do not show a cumulative effect, nor are they getting accustomed to it to such an extent as to lose the benefit of its action. There are many conditions which require such gentle, persistent cardiac stimulation. Chronic anemia, chlorosis, the chronic forms of pneumonia, pulmonary infiltration of tuberculosis, demand it to stimulate the heart's contraction and favor a healthy metabolism. I never knew I had, for more than 40 years, practised and taught anything unusual until the attention of the great German Congress on Internal Medicine was drawn to that very practice—my teaching not being known in Germany—by Dr. Groedel, of Nauheim. He was frowned down in 1899. Then Kussmaul, in "Ther. d. Gegenwart," of 1900, published his cases of continued digitalis treatment, and in 1901, Groedel found more favor. That is how the matter stands now, and should remain standing. There is no chronic ailment that does not enfeeble the heart and reduce circulation. Preventive doses of a cardiac stimulant are more than ever required when to general debility is added obstruction in the lungs.

The improvement of patients suffering from tuberculosis of the lungs is complex. We have to deal with objective and subjective symptoms. There is bronchophony, bron-

chial or even cavernous respiration, rales of different kinds, dulness, now and then hemorrhages, purulent expectoration containing tubercle bacilli, cough, pleural pains, night-sweats, fever, and emaciation. Most patients in New York City live in the small, airless and lightless rooms of a tenement house—Greater New York had, in 1904, 360,000 dark rooms in 38,000 houses—with insufficient or inadequate food. When such cases improve in great numbers, no accident must be credited with that result, and they do improve. Hundreds of times have I seen the expectoration became mucous after having been purulent, the cough looser and less, night-sweats modified, the appetite better, the temperature less, and emaciation stopped and weight increased. That has happened so often that there is no choice left me but to look for the cause of the improvement in my medication. Instead of losing, they would gain, recover strength, re-enter upon their work, and make a living for themselves and their families.

Excessive temperature may require treatment: cooler air, frequent drying up of the perspiration, sponging with alcohol and warm or cold water, irrigation of the bowels with cool water, quinin in the remission, but in the remission only, and occasionally one of the milder sedatives, combined with a cardiac stimulant, such as caffein, or with a moderate dose of whiskey and water. The painting of the chest with guaiacol has been recommended.

Use no acetanilid. I have almost despaired of the effect of my frequently repeated warning against acetanilid, the so-called antifebrin. Of all the preparations on the market, this cruel anilin poison is the worst. The western firm which disseminates that curse over the country, and that part of the profession which allows itself to be entangled in the complicity of prescribing it on its own blanks over its own names for their unsuspecting and confiding patients, stand guilty of malfeasance and malpractice. One of the greatest shocks to my feelings as a man and physician has been the discovery that our new Pharmacopeia, which should be the pharmacal gospel of both druggists and doctors, participates in the mistake of recommending it. In that Pharmacopeia, p. 5, you find

acetanilid; and p. 368, pulvis acetanilidi compositus—a mixture of acetanilid, caffein, and sodium bicarbonate. You recognize the dangerous stuff. It goes by the name of headache powders or by some exotic alluring name. Your Pharmacopeia recommends doses of 0.48 gm. (7.5 gr.), more than 0.32 gm. (5 gr.) of which are acetanilid—and does not even say how many doses the victim may take without having to pay his obolus to Styx. These headache powders were those a young laboring man had taken when he presented himself in semi-collapse and cyanosis a few days ago. They are those which their highest authority permits the pharmacists to sell over the counter. Altogether, I need not say, and you know, that the tendency of the New Pharmacopeia to adopt the compounds of the wholesale manufacturers and introduce them under different names, is an indignity offered to the profession and an encouragement to the nostrum trade.

Many of the intervening symptoms, and others belonging to the process itself, require their own treatment. Some coughs must be treated. A few drops of Magendie's solution, or a hypodermic tablet of 8 mg. ($\frac{1}{8}$ gr.) of morphin placed on the tongue and sucked down without water will be absorbed instantly and act, to say the least, almost as readily as a subcutaneous injection. Night-sweats are improved by a single daily dose—taken at bedtime—of atropin sulfate, 1 mg. ($\frac{1}{60}$ gr.) or less, with or without agaric acid, 0.01 to 0.03 ($\frac{1}{6}$ gr. to $\frac{1}{2}$ gr.). Excessive nocturnal cough requires morphin 8 mg. to 16 mg. ($\frac{1}{8}$ gr. to $\frac{1}{4}$ gr.), which, with or without a vegetable cathartic, is added to the same pills.

Hemorrhage requires ice, rest, cool air, morphin, lead, ergot under the skin, better still, adrenalin in several doses; sometimes ligature of the extremities.

Morphin and lead have lost much of their reputation, not on account of their failure, but because of the insufficiency of doses. When I want a drug to take effect in an emergency I want that effect now and not day after tomorrow—that may be the day of the funeral. The book doses of 8 mg. or 16 mg. ($\frac{1}{8}$ gr. or $\frac{1}{4}$ gr.) of lead subacetate are too small for any effect. Give a grain every

hour, with moderate doses of morphin. There is no such thing as lead-poisoning from so-called large doses of lead continued for two or three days. I never saw that sort of poisoning in a New York practice of 52 years, and I try not to be blinder, I believe, than my medical neighbors. You do not save a burning building with an atomizer, but with a hose.

In the chronic and subacute forms of osteitis, most of which have a tuberculous origin, phosphorus—not phosphates—is a tissue builder, when given in small and long-continued doses—in small doses, for when given in large doses it is a tissue destroyer. Spondylitis, coxitis, gonitis, inflammation of the tarsus and calcaneum are mostly tuberculous.

I have been, since 1869, impressed with the experiments of Wegner. When he fractured the bones of rabbits he would find that the animals fed on phosphorus produced callus in less time than those left alone. That is why I suggested the use of phosphorus in rachitis, and enjoyed the teaching and practice of Kassowitz, who, on account of the extensive use he made and is making of phosphorus in rachitis, is justly entitled to priority. Hundreds of cases of tuberculous osteitis I have treated with phosphorus, and feel certain to-day, as I was 30 years ago, that recovery takes place more frequently and more rapidly with than without it. In the same class of cases, mainly when the patients are anemic, I give arsenic. What I have never done without, these 14 years, is guaiacol. Nothing is more shortsighted than to rely on bandaging, supporting, or bracing alone. A child with Pott's disease is not crooked only, one with coxitis is not limping only, one with caries of the tarsus is not lamed only—they are sick and in the vestibule of death. Neither codliver oil nor malt preparations—though you call them Maltine and pay 10 times their value for the label—will render the services of guaiacol dispensable.

Similar observations are valid in connection with the tuberculosis of serous membranes, mainly the peritoneum and the pleura. The former is more frequent in children, the latter in adults. Both I have treated extensively with

guaiacol—with or without arsenic and a cardiac stimulant —and know in my innermost heart that I have done good.

In addition, permit me to mention the persistent treatment of chronic pulmonary tuberculosis with calcium biphosphate, recommended by some good observers. At present my own experience is too small to count.

One more word. Our special duty this week is to exchange opinions and experiences, and experiments contemplated for the exile—not of tuberculosis patients, but of tuberculosis. After all, it is my connection, no longer an opinion, fortified by my own observations made these 52 years in New York, that we can never assert too often that the treatment of tuberculosis requires light and air, and food and rest—very well—but that there are medicines that have favorable results, even under unfavorable circumstances; and, moreover—and I mean positively what I say now—that we cannot do without sanitariums, but that the best sanitarium treatment may be made more effective by medication.

THE MODERN DOCTOR

Our first medical traditions date back to the East Indies and Egypt; our first real knowledge is derived from Hellas, the mother of the world's culture. Even Hellas had no regular physicians until the period of Lycurgus. It is true that Homer eulogizes the man of healing, but medicine was mostly theocratic. Gods, demigods, and their priests healed the sick. It was Apollo who smote men and armies with infectious diseases, and again relieved and saved them. But as there were always those who were sick and injured, attempts to aid them were the results of sympathy. Herodotus tells us that in Babylon the sick person was carried to the market place and took his choice from among the various cures advised by the multitude. In Greece the temples of the gods in which the priest practised celestial fraud and secured terrestrial experience, the tablets on which individual ailments and remedies were collected accumulated a store of available advice. But the translucent sky of Hellas did not permit of a predominance of obscurantism; her shrewd politicians and profound philosophers would not be satisfied with the mental slavery engendered by credulity; in the absence of manifold knowledge of natural things they began to philosophize.

Empedocles taught a theory of affinities—he called them love and hatred—that regulated the globe, which was composed of four elements, viz.: air, earth, water, and fire. In the animal body these were represented in blood, mucus, and yellow and black bile, and laid the groundwork for a humoral theory, while Democritus and Epicurus established the first atomistic theory and the solidist pathology. In the last century before Christ this was elaborated by that learned and popular Greek physician of Rome, Asclepiades. Hippocrates was brought up in the theories of Empedocles, but never was there a more observ-

ing, empirical, reasoning, and practical mind than his; never a warmer heart, a more ethical conscience, or an intellect freer from hypothetical or unfounded assumption.

Neither Aristotle nor Plato appreciated Hippocrates at his full value. Though the former had all and more than the learning of his period, he was too much of a theorist like Plato himself to understand or to follow the great physician in his empiricism and the observation of facts. But it was Aristotle, and after him Herophilus, and two centuries later Galen, who added immensely to the knowledge of anatomy. Thereby they created a foundation for surgery, which during the reign of the school of Alexandria nobody had the unscientific tendency, rather prevalent with us, to separate from medicine. Galen could have continued to be the idolized creator of medicine to our own times if he had been able to keep apart from the speculations of Greek philosphy and had clung to the Hippocratic method of observing without theorizing.

Still, his means for obtaining knowledge were limited. His anatomy is that of animals; the teachings of the Koran, centuries afterwards, were opposed to the study of *human* anatomy, and both Galen and the medicine of the Arabs, while adding profusely to what we should call clinical and pharmaceutical knowledge, fell short of being the elaborators of Hippocratic medicine. Still, Galen and Aristotle controlled the thinking of the world until the era of Bacon, for fifteen hundred years.

Such an unbounded influence is never exerted by a single man anywhere except in religion or in science. In politics the gradual evolution of a nation, or of mankind, is not governed by an individual. No Alexander, or Cæsar, or Charlemagne, or Napoleon, or much smaller men with only a single thought in their heads like Bismarck, could have shaped the world anew, if the social and political situation had not favored them. History made *them,* but in science single men may make history. So did Paracelsus when he discarded the yoke of Galen, who had reigned undisturbed 1,600 years. So, towards the end of the eighteenth century, did Morgagni, when he introduced anatomical thinking into medicine; Haller, when

he taught the functions of different organs, mainly the muscles, and discovered the existence of sensitive nerves, and of the different directions of nerve currents. So did John Hunter, when he established pathological anatomy and experimentation—for that is what he founded when he preached the paradoxical text: "Do not think, try"; Jenner, when he laid the foundation of sero- and organotherapy; Bichat, when he created histology. That is what Virchow did—guided by his predecessors and by Schwann and Schleiden—when he fixed the throne of life in the invisible cell; or Pasteur, when forever he demonstrated the omnipresence and omnipotence of the unseen microbe. "The universe itself is narrow," says the poet, "when compared with the vastness of man's brain."

Still, the few centuries following the time of Bacon and of Paracelsus were barren in their effect on clinical medicine. Sydenham, Boerhaave, Van Swieten, and Peter Frank were great and influential, but the foundation of medicine was not sound, and wanton systems followed one another both in philosophy and medicine.

The clouded mental atmosphere produced two peculiar systems, the modifications of which claim our attention this very day. They were Mesmerism and Hahnemannism. Mesmer was not always a fraud. Contrary to most frauds he was learned, but his mind was always tinged with mysticism. His very inaugural thesis, on the influence of the planets on the human body (1766), betrays him. He sank so far as to treat diseases by animal magnetism at a distance. Our present fakirs are only shallow imitations.

Hahnemann began his career with a paper published in 1796. Within a few years he completed his teachings, the principal of which were as follows:

The only vocation of the physician is to heal; theroretical knowledge is of no use. In a case of sickness he should only know what is curable, and the remedies. Of the diseases he cannot know anything except the symptoms. There are internal changes, but it is impossible to learn what they are; symptoms alone are accessible; with their removal by remedies the disease is removed. Their effects can be studied in the healthy only. They act on

the sick by causing a disease similar to that which is to be combated, and which resolves itself into this similar affection. The full doses required to cause symptoms in the well are too large to be employed as remedies for the sick. The healing power of the drug grows in an inverse proportion to its substance. He says literally: "Only potencies are homeopathic medicines." "I recognize nobody as my follower but him who gives medicine in so small doses as to preclude the perception of anything medicinal in them by means either of the senses or of chemistry." "The pellets may be held near the young infant when asleep." "Gliding the hand over the patient will cure him, provided the manipulation be done with firm intention to render as much good with it as possible, for its power is in the benevolent will of the manipulator." Such is the homeopathy of Hahnemann, which is no longer recognized in what is called homeopathy to-day.

A modern critic (Tagel) says of Hahnemann's teaching that "his new system, which was announced with ferocity, and appeared unintelligible and crude to a sound mind, could not but impress the multitude, which did not differentiate between one bad logic and the other. His contempt for actual observations and experience pleased the igonrant, his violent criticisms of everything preceding him appealed to the unschooled protestant mind; indeed, he compared his cause with the fight of Protestantism against Catholicism; his very violence tallied with the revolutionary spirit of the time; the mysticism of the medicinal power of a substance when reduced to an unthinkable minimum was an astounding exemplification of the superiority of the spirit over the body; the ridicule and persecution to which his teaching and his vehemence exposed him were claimed as martyrdom."

Moreover, the homeopathists had a real martyrdom. Some sixty years ago the regular profession of the United States turned against them with the same vehemence that was exhibited by Hahnemann himself and his first apostles. That was taken by the American public as unfair; it always takes the side of those who are or appear to be persecuted. From that time dates the success of homeop-

athy in America, and its conquest of the hearts and minds of a large portion of the public. That is why homeopathy had a longer life than any other system which was the outcome of any man's mere thinking or mere imagining. Indeed, all systems are of that origin—Stahl's, Brown's, Rademacher's, Thomson's, no matter whose. To-day, however, medicine has reached that period of evolution which no longer permits it to be called a system. Since it came to be studied like one of the natural sciences, like biology, there are no schools any more, but simply medicine. Homeopathy also has undergone changes like everything mortal in its own ranks. We in New York know that better than most States. Twenty-five years ago there were in our city a hundred medical shingles with the title homeopath painted on them. I believe there has not been one these ten years. The examination papers of the State Board of Examiners are the same for all the three boards, with the exception of those questions which refer to materia medica. A goodly number of practitioners who are called by the public by their former name never use it themselves; there is no doubt that many who graduated from a homeopathic college and are called homeopaths by the ever faithful ladies of the hotel piazzas are satisfied to be practitioners of medicine. And I have reason to believe that the time is not distant when there will be no school, no sect, but medicine only. If a practitioner, after having, by passing his examinations, satisfied the people of the State that he is competent, chooses with the consent of his patient to regulate his therapeutical measures to suit himself or his patient, that is his own taste or business. For remember what we have sworn to in our Hippocratic oath: "I will follow that system of regimen which according to my ability and judgment I consider for the benefit of my patient." But I believe firmly that in a short time we shall have one board of examiners in place of three, and one solid body of medical men willing and competent to fight for the welfare of the public against quackeries of all sorts.

In New York State we had year after year to convince the legislature that the claims of so-called osteopathy and

others, just as pretentious but less aggressive than Christian Science, were contrary to common sense and the interests of the people. When lately I read before the committee of the legislature the following alleged definition of osteopathy—it cannot be learned by heart—as contained in the bill in which they asked recognition and a special board of examiners—please to listen: Osteopathy means that science or system of healing which treats diseases of the human body "by manual therapeutics for the vital remedial forces within the body itself, for the correction of misplaced tissue and the removal of obstructions or interferences with the fluids of the body," all without the internal administration of drugs or medicines—and asked them whether they understood what it meant, and told them that I did not, I knew that this legislature at least was proof against the claims of osteopathists to have a board of State examiners of their own.

A few weeks ago a patient with the symptoms of a weak heart muscle, whom I had seen a few times, asked me whether I approved of his having consulted, upon the advice of a friend, an osteopath. When I told him that I did not approve of being insulted by his asking me whether I consented to his consulting a quack he appeared crestfallen, and left. He reappeared after some little time to apologize, as he said, for having proposed a question I disliked to hear. My reply was: "Do not apologize to me, apologize to yourself. I can understand that there are ten thousand Catholics in New York who are cured of certain nervous diseases or disorders by kneeling before a Maria, or by praying to a saint; I can even appreciate that hysterical men and women are benefited by the confidence they have in what they are pleased to call Christian Science; but it takes a frame of what you call your mind and a mental darkness which are not intelligible to me to believe that any disease can be influenced by the anatomically and physically impossible feat of twisting a spinal bone this way or that way."

Gentlemen, I have seen graduating classes passing before my eyes and out of view these forty-five years. Many

of them whom I bade Godspeed have passed away, many have filled their places with success and renown, others have disappeared from sight without leaving their imprint. Still, there are opportunities for everybody. It is true enough that health, circumstances, and luck have a good deal to do with the happenings of whosoever is mortal. But there is no one who is not to a great extent responsible for his own fate. Selfmade men endowed with principles and endurance are plentiful in every trade and profession. Some rules indigenous with every ethical man should be followed; and, perhaps, it is unnecessary to urge them here. Still, permit me to express in words part of what I should wish you to mind. You have been undergraduate students until this commencement. Let it be the commencement of your postgraduate study. I take it that you have learned enough to be able to learn more. I once read of the happiness of him who does not know he is no doctor; that happiness should not be yours. Whoever would have stood still with his achievements of forty or fifty years ago would be a hopeless mental corpse. The good doctor of only twenty years ago would be a musty relic to-day if the progress of study and of science had passed him unnoticed. Only constant attention and work will keep you young and abreast of the times. Follow closely the literature of your science and art. Collect a library of your own according to your means. Be sure to take half a dozen medical magazines, one of the great weeklies, a few high grade monthlies and quarterlies, and one historical journal. For, as without the knowledge of the history of your country you cannot understand its structure, or without that of the embryo the full development of the body, so without that of our science and art you will not be a citizen in your profession. It is a pitiful sight to learn that many efforts are wasted in rediscovering what should have been known. I remember the disappointment our patient and great O'Dwyer experienced when after years of hard work and close thinking he learned that a third of a century previously Bouchut came near to the accomplishment of the intubation of the larynx in membranous croup. It is true that, after all, the

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world is ringing with his praise, but years were spent by him in unfruitful preparations.

When your private library does not suffice, turn to public collections. Where there is none, create one. There should be no county society without either a circulating or a permanent library. You will always find friends in the Association of American Librarians, and in the large libraries of the country. That of the New York Academy of Medicine alone furnishes much valuable material to several dozen of medical libraries all over the Union.

Try to remain in or improve your contact with all the branches of medicine. There is, it is true, nobody who can know all the various specialties or practise them. Seneca said, 2,000 years ago: "The man who is everywhere is nowhere"—*nusquam est, qui ubique est*—but you should know enough of them to appreciate their relations to the entire organism. Those of you who mean to practice a specialty, I advise to go into general practise first, and build up a specialty in later years on the strength of your general knowledge and attainments. Those who expect to obtain reputation and riches out of premature limitation will not attain success. That such a one cannot reach distinction in his own profession goes without saying; for those specialists who enjoy the confidence and respect of the profession have worked hard and are known for their general and broad information. One cannot impose upon the hearts and purses even of the laymen for any length of time without being found out. The homely saying that you cannot fool all the people all the time is correct. It may be true that there are many reasons why we should not have a high opinion of the discernment and discretion in matters medical of a large part of the public. For there is too much clairvoyance, Christian lack of science, medical sectarianism, and medicine chest quackery and too much dilettanteism amongst our well clad and well fed semi-instructed but uncultured and mentally unbalanced classes. But, if there is any science or art in which the dilettanteism both of the narrow specialist and of the busybody lay adviser is detrimental, it is in medicine. We have been told that a little learning is a dangerous thing. That

is a mistake. It is not learning that is dangerous, it is ignorance.

Do not stick to your books alone. They are masterful leaders only when they open your eyes to see the world with. You cannot learn medicine from books alone any better than you can chemistry or politics. Look for bedside experience. Unfortunately, however, there are very few teaching institutions in our country in which clinical instruction is what it should be. Few undergraduates study in schools with hospitals of their own. A mechanic is expected to learn his handicraft before practising; but the medical student is permitted to practise on his fellow men without having the required schooling. That is what gives so much probability to Ughetti's story of a Scotch king who would not admit a doctor to his own land until he had practised at least twenty years amongst his enemies. The lack of clinical experience amongst our young physicians should be more appreciated. Plain talk of this kind may be more wholesome than pleasant. To remedy the evil we want hospitals connected with the schools, not dispensaries only, and large endowments. If rich men and women will spend their wealth for such a purpose they will not so much benefit the medical world as they will benefit millions of fellow creatures. Forty-five years ago the New York Medical College, which is hardly remembered now that it has disappeared these forty years, was the first school to establish a hospital for clinical instruction under its own roof, and this was done out of the contributions of the poor professors and a few friends.

Those of you who follow up your clinical studies in other parts should not believe, however, that the very large clinical hospitals are the most instructive. I think every medical school should have a hospital with selected cases of all kinds containing from 150 to 200 beds. But for the young student or physician to be admitted to large wards, with no personal work and initiative, is almost useless. You learn no botany by staring at a thousand trees and bushes, and no medicine by being driven alongside of hundreds of bedsides. Seeing is not understanding, just as little as the man in practice who, in the course of many

years, sees a great many cases with the same indolence, and commits the same mistakes, may justly claim experience. The Siamese twins were carried over fifty thousand miles, but I am sure the only place they knew anything about was their South Carolina village.

Are there particular methods of succeeding in medicine? Books have been written to answer that question. When I read them I wished they did not exist. My advice is, do not rely on any artifice. You see doctors succeed, or not, temporarily or permanently, whether they are ugly, or beautiful, ill mannered or gracious, frowning or, what is worse, eternally smiling, alcoholics or sober, retiring gentlemen or dancing masters and ushers, married or otherwise. Indeed there are those who get married to have an interested attendant on the hall door by day or night; and I have, on the other hand, known unmarried physicians who assured me that they had obtained a large practice by remaining on the market. That sort of advertising which has become an art in modern life is about the most vulgar of all, worse than the newspaper advertising of the downright shameless quack, or the man in more or less of a position who is on good terms with some reporter who visits his clinics—always "without his knowledge"—and is made to extol the skill of the great man, his friend. Even worse are the articles, long or brief, written by metropolitan doctors for advertising sheets called journals, too worthless to serve as soap wrappers.

Then there are the optimists and the pessimists. The man who always gives a good prognosis may do so through good nature and the sympathy he has with the anxiety of the family. His motives are good, but his judgment is not correct. I have suffered from that weakness much more than perhaps my patients, and while I hope you will always try to spare the feelings of those who trust you, you may, by being too soft hearted, cause great disappointment. Do not assure anybody that there is nothing to fear. Any slight ailment may give you the lie; a small opening in a dyke may produce a deluge. That is why I advise you not to think lightly of a possible danger, and not to postpone measures of relief or salvation. An acute

disease, particularly an infectious disease, may be like a fire in a tornado. The house may be down before you have called the engine. When you have to deal with a disease that necessarily must exhaust the power of the heart, do not wait to employ your measures until it is too late. In a pneumonia, one of your daily enemies, you know that every day must and will add to the danger of heart strain and heart muscle deterioration. You have no right to wait for heart failure or exhaustion—any Micawber can do that—if you do, you will generally be too late with your digitalis, caffeine, ammonia, camphor, or musk. Employ them in time. To postpone the use of alcoholic treatment in large doses in septic diphtheria until the tongue is dry and the pulse flies up to 180, is no less than homicide. To rely on nature is indolence. Nature is kind, but nature is cruel as well. The old proverb that the doctor is the servant of nature, if it is to mean that he must fold his hands over his stomach, and look wise and write a certificate of death is a sophism bred by criminal superciliousness. Would you trust nature when a child is suffocating with croup or would you tracheotomize or intubate? When a hernia is strangulated will you permit gangrene to kill your patient? If not, why not open a vein when, on the third day of a pneumonia, there is cyanosis pulmonary œdema, or dilatation of the right ventricle, and give digitalis and musk in 10 or 15 grain doses?

Then there is the pessimist who either sees or proclaims danger in every mild case. If he sees it he is incompetent. But the suffering public is so ignorant as not to distinguish between a competent and an incompetent practitioner. Still such a man does not *intend* to do harm. *But,* the clever politician who feeds on the fears of the patient or his friends and exaggerates the danger of the illness and the value of his services, who pretends to save lives by the score when there is no risk—well, just beware of him.

There is another class of politicians, either clever or clumsy, that makes game of what is sacred to many people, and tries to make a living out of other people's feelings or convictions. I ask you the direct question.

tient rest. Do not allow the nurse to insert the thermometer every two hours except for the very best reasons. Know how to leave him alone and keep him alive while his heart, blood, and nerves are engaged in supplying him with oxygen and eliminating his toxines. Spend your wits on sustaining him and facilitating his circulation by hygienic and drug medication and *allow* him to get well. All the rest is experimentation, and man is not *animal vile* on which experiments, even proper and otherwise justifiable, should be made. Imagine yourself in his place and him in yours, and do not spoil his chances and yours by interfering with recovery. Otherwise it may happen what every one of you knew so well twenty years ago, viz., that:

> "All the king's horses and all the king's men,
> Could not put Humpty Dumpty together again."

Still, I say, make your diagnosis. You have so many more methods of getting at it than we had twenty and thirty and fifty years ago, that it has become, as it were, a natural inference on the part of a young man, just through his examinations for a hospital appointment, to believe that his superior officer might as well resign at once in his favor. The sobering influence of the failures of the approaching lean seven years has not been felt yet. When he will have been in practice fifty years, the young man will learn that there are others who know as much as he or a great deal more. But, after all, *we young men* do make better diagnoses than those which were made when your fathers were born. That was a time when the diagnoses of paralysis, of dropsy, of chest disease, of nervous and bilious fever was legitimate and full fledged, when there was no difference between typhus and typhoid, when there was a display of great satisfaction at being able to speak of the rheumatic, the uric acid, and other diatheses, of lithæmia—but I had better stop, for I am on dangerous ground. For the rheumatic and uric acid diatheses still rule in the supercilious consciousness of those who are not so wise as we, the two thousand here. You know what when there is uric acid in the renal secretion, as there

ought to be and is, you have the malefactor and go for it; when there is none, and the specific gravity is down to 1,000, so much the worse; the malefactor hides itself in the interior and the poor mortal is drugged at the expense of his (mostly her) health and purse. Still, I say, make your diagnosis in the new way, but also in the old ways; and do not sham. When stethoscopes were not in everybody's pocket, fifty years ago, I had a colleague in New York, who purchased one of the straight German style and outshone us all by having it ornamented with gold. I have been reminded of him when I see some of the modern "leeches"—you know that doctors in King Edward's time were called leeches—going about armed with the Thoma Zeiss's blood counter and Fleischl's hæmoglobinometer in their satchels. The eye, accustomed to the study of the features, the pupil, and the color and condition of the hair, the color, wrinkling, and veins of the face and hands, the sense of touch developed to the utmost to judge of the character of the pulse, of the condition and size of the viscera, the estimation of the expression of anxiety or terror, or indolence of the sufferer, of the position he assumes, of the dryness or fissures of his lips, of the temperature of his feet; all these also should be carried by the carrier of the satchel, but too often they are not ready for immediate use. I took the liberty many years ago, to assert that brains were a handy tool for a physician. I am wiser now; being so much older, I now say *practised* brains.

Practised brains will easily overcome a difficulty which is encountered in the latest overdevelopment of specialism in medicine. The last few years have evolved a new variety of medical diagnostician, the so-called laboratory man. He sits at a certain window—northern exposure preferred—all day long and examines specimens; the bedside knows him not, nor he the bedside.

That I do not speak of the great men of the laboratories, of the Theobald Smiths, of the Ehrlichs, is understood. Medicine is built up of millions of stones, some of little account, some cornerstones, and we exist on serious path-finding research. You understand me at once when I say that the attempt to discriminate between the laboratory

man and the clinician is wanton. The laboratory is in the service of the bedside, a handmaid, available or indispensable according to the circumstances of the clinician, is no less, and need be no more. The individual clinician may not himself be the omniscient or omnipotent expert, but clinical medicine requires the laboratory as one of its aids. That is why every student should take his course and his examination in bacteriology, physiological chemistry, and clinical microscopy. Every patient that ever applies to you has a right to expect from you all the exact aids and branches of knowledge that make the modern doctor.

Do not rely on tools alone. Before there were our instruments of precision, our sphygmographs and manometers, there were great doctors in many lands. Many of our modern medical discoveries and rediscoveries you may read of in the works of Hippocrates, and many modern instruments were found in Heister, two hundred years ago. Our own time teaches the same story, viz., that clinical observation alone arrives at many conclusions laboriously evolved later by the microscope and by experiment. For instance, before the bacillus of diphtheria was ever thought of, a mere clinical taught that almost every case of localized laryngeal croup was genuine diphtheria, and was contagious, and that many cases of so-called amygdalitis belonged to the same class. He also taught that laryngitis with a high temperature was not dangerous, while the localized obstructive croup that ran its course without fever belonged to the dangerous membranous type. It was also known that genuine uncomplicated throat diphtheria ran its course without much glandular swelling and that the most septic cases were often those that did not give rise to any fever. All these things have been proved subsequently by the findings of bacteriology. Thus theories and explanations will often limp behind the knowledge of facts. They are welcome, however, three times welcome, for science means the comprehending of facts together with their causes and correlations.

The more you know the better will you be in a position to judge the utility of new teachings, theories, and meth-

ods. Let me give you an instance of what occupies many medical minds just at present. Infectious diseases, such as rheumatism, scarlatina, etc., are believed to enter the organism through the throat. The teaching is that they pass in through the tonsils. Now, it is true that the tonsils consist of lymphoid tissue which is apt to absorb whatever comes in contact with it, particularly when the surface is sore, maybe in consequence of a burn, a hot drink, or a cold. Even tuberculosis has been believed to enter through the tonsils, and a modern author has preached a crusade against the tonsils. They must be removed totally if mankind is to be freed from its arch enemy. Unfortunately, however, this author added that there were few men living who could remove the tonsils according to his effective method. In the same way the tonsils are charged with admitting other infectious diseases. But as early as 1860 I proved that diphtheria, for instance, when it affected the tonsils alone was mild, while the danger was great when the neighboring surfaces, particularly those of the nose, were affected, and twenty years later I was able to publish the anatomical reasons for that difference. So I have no doubt that the tonsil theory will be restricted. Indeed, in comparison with the dozen lymphoid follicles of which the tonsils are composed, there are thousands in the proximity. It is through the latter rather than through the tonsils that the invasion of infecting microbes and toxines takes place.

Why do I say all this? Because I wish you not only to be willing recipients of great men's gifts, but to learn to see with *your* eyes, to hear with *your* ears, and to use *your* judgment. Believe Epicharmus when he said 2,000 years ago: "Soberness and constant doubt, these are the marrow and bone of the mind."

It is not necessary to live in big medical centres to make good and epoch-making observations or even to write immortal works. Beaumont was a military surgeon in one of our outposts when he gathered the materials for his "Experiments and Observations on the Gastric Juice and the Physiology of Digestion" (Plattsburg, 1833). Drake was a practitioner and teacher in a small town when he

published his "Diseases of the Mississippi Valley," McDowell was a country practitioner in Kentucky; Marion Sims in Alabama.

You gentlemen have been born and bred in a democratic country. Thus it should be easy for you to have respect for the individual patient, male or female. I know that what I have seen in European clinics could never happen in our country. In Europe they expose nude women for half hours at a time, shivering and almost annihilated with shame and terror, to the gaze of students and nurses. Our students would scorn and hiss the teacher who would thus blunder or sin. That is why you American men will find it easy to imagine yourself in a patient's place. When you cannot save, you can relieve or comfort. Now, a learned and sagacious friend in the Far East has repeatedly expressed his opinion that truth should be told in every case no matter what the result. I decline, have ever declined, to follow that ruling. I never told a patient he must die of his illness, and hope I never shall do so. Tell a patient he must die of his cancer, and you will shorten his life and make the brief remnant of it miserable beyond description. Tell the truth to one of his reliable and discreet friends.

Truth is a remedy. Both have their indications as to individuals and timeliness. The same remedy, given at different times and for different conditions and to different persons, may have different effects. Never forget that the good of your patient is your first and only object. To tell the whole truth will sometimes kill, in other cases it will benefit, provided it is given in proper doses. For instance, a patient will come with a cough and short breath and the history of frequent colds; perhaps even of occasional bleeding. He has the physical symptoms of pulmonary tuberculosis and you find tubercle bacilli in his sputum. Will you tell him that he is tuberculous or will you conceal the fact? When you tell him he is tuberculous he will ask the momentous question: I never thought I was consumptive. What will you do about it? I think the very solution of the difficulty, if there be any, is this: You will tell him that he is tuberculous, but not consumptive, that he is not

going to die, that he may become consumptive if he should get worse; that many, indeed most people like him have a good opportunity to get well, that it is a common experience to find people die of all sorts of diseases at sixty or eighty years of age, in whose lungs there are tubercles healed; that, indeed, there are comparatively few persons who have had no tuberculosis some time in their lives; that he can save himself and protect his family with a moderate amount of care and foresight. You may do that and be truthful. You tell him truthfully that he has tuberculosis and that it is his duty to get well. What you will not do is what I experience several times a week. A poor patient tells you his doctor has told him he has consumption, and unless he goes to Colorado at once he will die. Imagine a poor person, very often with a wife and children, with no money to pay even his railroad fare, much less to live upon, told in just so many words that he cannot be helped. There is much ignorance, thoughtlessness, and cruelty in the intercourse of men, but I know of no act of brutality that equals this treatment of poverty and malady stricken persons on the part of members of our own profession. There is no reason to indulge in it in your relations to the sick. If you have the cruelty of your convictions, try it on the rich who are independent of you, but neither on the poor in private life nor on hospital patients.

Never, my young friends, give up watching a case as long as you are in charge. Most cases of disease have a tendency to get well; that does not mean, however, that the sufferers should be left to themselves; for the measure of strength saved from an illness determines the duration of convalescence, the restoration of the tissues, and the future power of resistance. Many may recover unless they are neglected; if they do not so recover, their blood is on your heads. Some will die no matter what you do or try; even then euthanasia is welcome if you cannot procure more; it is better than the anguish and the suffering of many that are moribund. In many such conditions the question has been raised whether or not it might be permitted to shorten the life of a hopeless martyr who is in torture which *must* end in death. I was present when a minister of the gospel

in my city rebuked us doctors roundly for not finishing the misery by a friendly poison. When I heard it, I remembered the little sentence in the Latin primer of my early childhood. *Medæ projiciebant moribundos canibus;* the Medes threw the dying to the dogs. When we doctors become Medes, we shall obey the ruling of that clergyman. Meanwhile we have sworn with Hippocrates: "I will give no deadly medicine to anyone if asked, or suggest any such counsel."

In order to fulfill the indications required by the sick, the convalescent, or the dying, make yourself acquainted with the rules of nursing and dieting, and with the nature and effect of remedies both external and internal. When I was a young student, the medicine of Germany was just waking up from a forty years' slumber caused by the unintelligence of what was called *nature philosophy.* At that time the Viennese learned pathological anatomy from the French. One of the greatest teachers of that branch was Rokitansky. For him all there was in medicine was the study of the dead body. For Skoda, however, all there was in medicine was diagnosis, mostly through percussion and auscultation. For the patient, all there was to do was to go to the hospital, to be diagnosticated by Skoda, and to be opened by Rokitansky. Medical science and the patient met only twice, once on the hard hospital bed, next on the autopsy table. The patient had done his full duty when the diagnosis and the result of the post mortem examination agreed. Of therapeutics there was none. The time of big medicine bottles with the nauseating draughts had gone by, thanks to Hahnemann; whatever was presented by Hahnemann, however, could not meet with the approval of unsophisticated savants. So there was no drugs, no treatment. While formerly both medication and bloodletting had been overdone, now everything was discarded. Dietl, of Vienna, and Hammernjk, of Prague, founded that nihilism of the Vienna school that under the flag of so-called pure science had resulted in driving the patients into the camps of sectarians or quacks, who after all hold out some promise to the despairing.

All that has changed; modern medicine has learned its

responsibility to the individual patient and to the community. We have entered upon a new area, that of therapy; both the individual and the community are recognized as claimants upon our bounty.

Gentlemen you are not alone in the world, nor in the profession. You could not live a hermit in the midst of millions, away from the village, county, State, nation, and the universe. A hundred ties bind you to benefit and be benefited by the rest. So you are bound up with the profession from the first day you enter it. I advise you to join one or more societies at once, at all events your county society, or any other that commends itself for its scientific work or for its affiliation with the American Medical Association. The complaint we often hear that there are too many medical societies may be justified as far as large cities are concerned, but there should be enough of them all over the country to give an opportunity to every practitioner to join at least one. The benefit to all its members is mutual. As there is a political, so there is a professional citizenship, meant to improve the individual, increase his knowledge, compare experience, adjust mistakes, and learn modesty. We were not made to be alone. Capsulation kills the efficacy of trichinæ, bacilli, and men equally; and the interests of a profession or a political commonwealth are not safe unless in the application of a universal democratic spirit. Nor can great results be obtained except by the altruistic co-operation of many. Legislators were aware of that more thoroughly a century ago than at present. At that time they were always willing and anxious to endow the medical profession with such legal rights and privileges as would enable it to look after the interests of public health and sound legislation. Even the authorization to practice was left to their judgment. Nor has the profession ever to my knowledge misused the confidence placed in it. The Sanitary Commission of the civil war which has become a model for the world's imitation and the spiritual mother of the Red Cross was controlled by the spirit of such eminent doctors as Cornelius R. Agnew and Ernst Krackowizer. The fight against epidemic diseases, which, as Virchow expresses it, should teach a states-

man that when they exist they are a preventable or curable disorder in the social and political organism, has always been taken up by medical men. Unfortunately, however, it is too often true what Anarcharsis said of Athens, that the wise men do the talking and the others the acting. A few weeks ago, Gorgas and Reed and Panama formed no exceptions. A number of years ago we spent a millions a day on a war of our making while a mere quarter of a million was refused that was to be spent on an instruction camp and life-saving station. With what we spend in half a year to keep the survivors of a foreign population in subjection, we could eradicate tuberculosis from the United States within a generation. The battles against disease, prejudice, shortsightedness, and incompetence are always fought by the medical profession, sometimes in single combat, more effectually, however, by consolidation and co-operation. To this profession you have dedicated yourselves. Be sure, my friends, that its practice be not a trade for you, but a vocation and a sacred calling.

Many of you will enter the practice of medicine within a reasonable time. When your medical neighbor has patients, while you are still wanting, never grudge him his own, and—wait. When the first one has turned up, never feel that you own him. When your neighbor is well spoken of, do not believe that your reputation suffers when he is eulogized, and watch your shoulder lest it shrug. It is better that patients should seek you than that you run after them. Do all you can and all the teaching of your your medical friends and of such books as you have reason to believe in. Do not despise after your graduation a good text book. I consult them to-day, aye, even my own, for on a page or two some of them may contain the ripe experience of a generation; indeed, not every text book is compounded by a young man at the beginning of what he means to become a brilliant career. In the beginning of your practice—and later on for that matter, if time permits—be sure to read up in reference to every case under your care, and take exact histories. Never believe you know all about any case, or enough—for I assure you you

don't. At least I don't, though I have studied medicine nearly sixty years. When a patient leaves you for some other doctor it depends on your temperament, or vanity, or needs, whether or not you feel chagrined; but do not blame the doctor who is called in your place. On the other hand, when another doctor robs you of your patient by hook or crook—they say such things do happen—be sorry for that doctor, and for the profession he should not belong to, and be glad you are not the other man, but a gentleman. Remember that a gentleman finds it easy to compete honestly; when you are not treated that way, it worries you—but *you* are the gentleman, and people will eventually find you out. Not to take honest competition on the part of others kindly shows disregard for the rights of others, either doctors or patients, and bad citizenship, and exhibits a jealousy, avidity, and senility of the young or the old heart.

Unfortunately we are not all angels. Indeed there was a time, not very far distant, when the facilty of obtaining a diploma and the license to practice so filled the profession with undesirable men and women as to crowd the ideal as to what a physician should be to the wall. It is only with the growing difficulty of matriculation and increasing severity of examinations, particularly also the establishment of State license boards, that the number of underweight doctors has become smaller. Their large number and consecutive competition rendered, as it does in any trade or vocation, the obtaining of a livelihood more difficult, and subjected the morals of the profession to a severe strain. Moreover, the commercialism which is the signature of our period has invaded industries, arts, science, and the professions, but has not proved so determined as it has in Europe, where poverty is greater and the innate pride of our democratic citizens is absent. The moral requirements of the profession found their expression in the code of ethics of the American Medical Association, first enunciated by an Englishman, Percival, in 1807. It has certainly done much good; it is true it cannot make a gentleman out of an evil disposed person; no law can. It simply codified the rules a gentleman will obey without being told; but the inexperienced may be guided by its teachings.

When finally, in 1882, we decided in the State of New York to modify and later on to abolish the code as a law book, as none was required to guide our methods of intercourse, the observance of the rules valid amongst gentlemen became even stricter in the profession of the State of New York than ever before. The result was, however, that our affiliation with the American Medical Association was interrupted. But such has been the gradual change of public opinion that the American Medical Association saw its way two years ago to abolish the code as a law book enforcing obedience, and to recommend for general acceptance in place of a criminal code a series of principles of ethics, not compulsory but suggestive, as a guide. This wise action has enabled the two warring factions in New York State to make active preparations for a lasting consolidation which is in the interest of both and, as we hope, also of the American Medical Association. The best men of the profession are actively engaged in overcoming the legal difficulties we met with in our way, and I know whereof I speak when I say that the old and tried men of the Medical Society of the State of New York, the very men who abolish the code as a law book with punishments attached, are pledged to accept the new principles of ethics as agreeable to them and a guide to the colleagues.

Now, gentlemen, there are two indispensable factors that render practical success possible. Do my young friends want to hear what they are?

First, be sure to accumulate all the science and art within reach.

Second, acquire the confidence of your patient.

The first recommendation is the main thing. Acute infections, epidemic diseases with a limited or unlimited course, injuries, operative cases, the vast number of the disorders of childhood, indeed the greatest number of ailments with disturbances of the blood or of organs, require nothing but a clear insight into the nature of the disorders and the knowledge of the action of the remedies, besides energy, consistency, and the knowledge of what is either possible or impossible. No confidence of any patient will

do him or you good. But, in a large number of nervous disorders, or of chronic diseases, the confidence of your patients, if you can obtain and retain it, is invaluable. When they know that you have worked for knowledge and possess it, and besides that you place it at their service and are interested in them, their confidence will be a powerful asset in behalf of both parties concerned.

Constant study, my friends, should be a requisite. Whoever cannot or will not learn from every case he meets, will not improve. A hundred cases not studied are like the first. Experience is not gained by committing the same mistakes a hundred times; and an old man, who never had a young heart and a searching eye, was never a physician that deserved any confidence. It is true that confidence may be misplaced. There are men in the profession as well as outside of it who play the confidence game. A long while ago there lived in New York two doctors with whom I was intimately acquainted. One of them called on the other long after midnight—it was before the telephone era—for a consultation, and the following conversation took place: "I am glad to find you up, come along, but what are you doing at this time of the night?" "I am studying." "You are very queer. One quarter of *savoir,* and three-quarters of *savoir faire,* that makes the successful practitioner." "Yes, that may be true, but where do you come in? For you have the three-quarters of *savoir faire,* but not the one-quarter of *savoir.*" Perhaps you can imagine the diplomatic relations between the two men became strained and there was no other consultation after this.

Be honest in all things! Work! And while you are studying and applying your drugs, do not forget the principal remedies offered, not as they say, by nature—she offers poison and salvation with equal generosity—but by common sense. Exercise and rest, open windows, hygiene in general, diet in particular, hot and cold water are together a panacea when judiciously ordered. Frequently you may do without the apothecary. Then, however, your patient may turn upon you. "Is that all? Exercise, open windows, starving, cold water, no tobacco, no coffee, no

high ball, and no prescription? Doctor, I know that much myself. I see I must go somewhere else. Now, doctor, really, is there any bill?" He does not appreciate that you have given him the quintessence of two thousand years' worth of medicine, goes to your neighbor, who gives him no quintessences, no two thousand years' worth of study, but a prescription and gets his ungrudged fee. Never mind, however, that very patient will some day return to you, will try to run down your neighbor, your so-called colleague, and you—well you will stop him from so doing.

For you will not forget that since the man does not know how to discriminate between doctors, you have to take the part of the profession in the person of your rival. The dignity of the profession should be upheld by and in every member. Do not speak ill of a professional brother, or half-brother, or cousin, for the layman will take your sneer as a slur on the profession. Now, when you are asked for your opinion of a medical man, who is above the average in knowledge and virtue, or who is your peer, do not spare your praise; when of a doubtful or no longer doubtful person, tell your inquirer that you are not the judge of other doctors. Mind, whoever of you says, or is believed to say, anything derogatory to the profession, which is a calling, and not a trade, acts foolishly. While not benefiting his worldly interests, he is injuring himself, the medical world, and the public that should in its own interest be educated into respect and appreciation. And never forget that praise of the other man does not detract from your worth.

One more lesson which you may take or not. Those of you who labor in the most beneficent, but least paid part of professional work, I mean that of the general practitioner, must never get tired. A doctor has no right to be tired, he must not get sick unless he wants to be sneered at, most of all, he must not permit himself to die; a poor doctor who could not save himself, though he expected to save others! You should be prepared to enjoy all the miseries of life, many of which you cannot escape. There are, indeed, good reasons for doctors being serious and perhaps tired looking, for they have shared thousands of sleepless

nights with their patients without finding rest the next day. But you are well off after all. Imagine you had been the doctor of Hephæstion, the friend of the great Alexander. When he died the king was sad and rather displeased. So he crucified the doctor and burned the temples of Æsculapius. Imagine how you would feel if you were killed every time you lost a patient and medical schools were burned as a punishment. We are more modern. The only thing that is crucified is your good name, in addition perhaps to a malpractice suit. I have lived through both and I still hear a women's shriek in a public thoroughfare fifty years ago: "There goes the murderer of my child." I tell you life is a serious thing, and you have to face it in the best way you can. Imagine you had been a practitioner in Venice under the rule of the God-fearing Godfrey of Bouillon, only seven hundred years ago. If you had been a Christian doctor you would have had to pay for every slave that died under your care; if a Hebrew you would have been hanged with a urinal in your hand. It should be your joy forever you did not live in the good old times of the Crusaders. What would you say to being a great discoverer and benefactor like Harvey or Gall, two of the great names in medicine. When and because they discovered and taught new lessons, they were persecuted and lost their practices. We are better off nowadays. But, still, listen to what I read in Ughetti's book—I believe he spoke of you and me: "When a doctor runs away from an epidemic he is a coward; when he stays and fights it, he is forgotten; when it kills him, his family will starve." I have seen all that and it looks gloomy, does it not? But you do not look frightened at all. And such is the fascinating sacredness of the calling you are entering upon, my young colleagues and fellow students, and if you asked an old man who had been through hard lifelong work and heart-rending scenes, through successes, maybe, and endless failures and disappointments, if you asked him what he craved to be if he began life again, he would, I think, reply: "Just a modern doctor."

PROPRIETARY MEDICINES

Goethe once said that the most interesting book that could be written would be a treatise on human errors. In that book, large like a library, the history of quackery—well meant or deceitful—would fill a large place. The distrust of medicine and its powers is as old as the world, for not many ever knew or cared to appreciate what medical science or art is capable or not of accomplishing, or should be held responsible for. Besides, the more uncultured or uncontrolled the human intellect the greater is the predominance of mysticism. In Greece quackery was rife, and Aristophanes made it the subject of ridicule. The elder Cato, who advised the use of cabbage against all sorts of disease and employed witchcraft and incantations for luxations, demanded the expulsion from Rome of the Greek physicians. The iatromechanics, who taught the direct interdependence of stars and man and prescribed pills compounded during the conjunction of Jupiter and Venus, and the medieval priests who cured with prayers and processions and auto da fés, must surely have met with failures and driven the sick somewhere else. Even the specialists among the saints, St. Anna the ophthalmologist, St. Judas the doctor for cough, St. Valentine for epilepsy, St. Rochus the veterinarian, may have made mistakes and proved incompetent.

Nor was the public always edified by the doctors in other respects. Hippocrates complains bitterly of the contests of doctors among each other. More than 2,000 years later Peter Frank thought and advised seriously that the only way to procure an orderly consultation was to call in the police. The maltreatment they were exposed to in the Middle Ages, the contempt in which wounds and ulcers were held, so that the medical faculty of Paris about 1300

committed their candidates by oath not to practise surgery; the barbarous methods of treatment by fire for the dangerous body fluids to which everything was attributed, and afterward the nauseating draughts with which the sick were punished until no better man than Hahnemann tried to redeem them—all that did not contribute to add to the dignity of the profession and to the confidence of the public. All that drove the masses into the arms of the sectarians and the quacks.

Then followed the era of scientific medicine, little more than half a century ago. It was built up on anatomy and physiology and was studied on biologic lines. We should have suspected that the darkness of quackery would disappear before the new light. On the contrary, it has grown in geometric proportions until the accumulated ignorance of quacks and fakirs has become a power in every land. The Germans, who like to style themselves the nation of thinkers, have more quacks than any other people. Indeed, Saxony and Bavaria have one quack to two regular physicians; Berlin itself has two to nine. It is in Berlin that 29 per cent. of the men among the quacks—including clergymen, workmen, stewards, bathhouse keepers, shepherds and university students—and 14.4 per cent. of the women had, before embarking in the practice of doing the sick people, collided with the law courts on account of theft, forgery and sexual crimes. It is Berlin that has a judge who, in discharging one of that ilk, said the man deserved the greatest confidence, for he was in possession of very good prescriptions obtained from the servant of a famous dermatologist.

Scientific medicine, as developed by the Vienna school more than fifty years ago, ended in nihilism. Patients, however, would not long be satisfied with being merely percussed and auscultated and autopsied. They had the pardonable wish to be healed and cured. But the only chance they were given was to serve as scientific material. With that they were not pleased and ran off to fill the offices and the coffers of the quacks. Then, after Skoda and Rokitansky, came Virchow, the great man of the century, the enemy of mysticism and obscurantism, the daily

discoverer of new facts and new methods in pathologic anatomy, the founder of the cell theory, the great anthropologist and hygienist, the assiduous therapeutist of the individual man and of society, the very realization of what Aristotle meant by his "politician," that is, the philosophical and scientific statesman. The great mistake of his life resulted from his democratic confidence in the people. His idealism moved him to believe that the people would instinctively distinguish between the physician and the quack; it was on his advice that the Prussian parliament opened the doors to the fakirs and reduced the medical profession to a trade. That was in 1869. He learned too late that people do not know who is who in medicine. People are not even taught by lectures or pamphlets or books, which are superfluous to the physician and not read by the masses. It is their nature to prefer to be in opposition at all hazards. They would rather pay hundreds of millions annually for pseudo-doctrines as displayed in books and journals and for proprietary medicines.

Do you care to know about how many there are? Up to October 12, 1900, there were United States patents for 321 disinfectants, 30 extracts, 48 hair dyes and tonics, 180 insecticides, 376 internal remedies, 56 plasters, 371 topical remedies, 78 veterinary medicines. There were trademarks for drugs and chemicals, 319; medical compounds, 5,794, which increase at the rate of 250 annually. The State Board of Health of Massachusetts has examined about sixty proprietaries for their percentage of alcohol. According to the board's report Howe's Arabian Tonic, "not a rum drink," contains 13.2 per cent.; Parker's Tonic, "purely vegetable," recommended for the cure of inebriates, 41.6 per cent.; Schenck's Seaweed Tonic, "entirely harmless," 19.5 per cent.; Copp's White Mountain Bitters, "not an alcoholic beverage," 6 per cent.; Greene's Nervura, 17.2 per cent.; Hoofland's German Bitters, "entirely vegetable and free from alcoholic stimulants," 25.6 per cent.; Kaufman's Sulphur Bitters, "contains no alcohol," 20.5 per cent, and no sulphur; Whiskol, "a non-intoxicating stimulant," 28.2 per cent.; Golden's Liquid Beef Tonic, "for treatment of alcohol habit," 26.5

per cent.; Hood's Sarsaparilla, 18.8 per cent.; Peruna, 28.59 per cent.; Lydia Pinkham's Vegetable Compound, 20.61 per cent.; Kilmer's Swamp-Root, 7.32 per cent.

We, the doctors, like Virchow, our great master, are responsible for a great deal of this injury that is done to the people. It is we that prescribe for a baby artificial foods, the composition of which we do not know. What Nature gives us at a low price—milk, cereals, salt and sugar—we know, and therefore, underestimate. Nature is democratic and offers the best she has for the rich and the poor alike. We covet what is unknown and high-priced. We prescribe nostrums of known or unknown composition; the latter is not far from criminal, the first would be excusable but for two reasons. One of them is that the manufacturer looks for the good he can do to himself, and that factories are not run for your benefit; the second is that an unalterable formula, though its composition may correspond with the label, should not be used by the physician who deals with a variety of cases, ages and circumstances. I do not blame a layman who indulges in self-medication after being treated by his physician with a remedy he sees advertised in the glowing headlines of his daily paper. I have known at least one of the infant foods that was advertised and sold for twenty years, and then publicly discarded by the manufacturer, who claimed to have at last found the proper—probably cheaper—compound. The layman must be excused for refusing to pay a doctor in addition to the advertising expenses of the tradesman.

We physicians do more. We take medical journals that advertise nostrums, that print "reading notices" of proprietary medicines, old and new; that sell pages of their issue to the trade; that print eulogies of factory products in the shape of "original articles"; that alternate their medical and advertising pages. When I spoke of this abomination before the International Medical Congress of Paris in 1900 a Western medical journal of that style asked the appropriate question: "Who, after all, is this Dr. Jacobi? If it had not been for us, the journals, he would have lived and died in obscurity."

Thus it is that even the mind of the medical man is gradually poisoned. What these sheets do not, perhaps, accomplish fully, the glib agent—sometimes an M.D., who gains access to you by the card he sends in to you—will complete. He dumps his wares—his blotters, ink-stands, paper-knives, pencils, blank books and almanacs—on your table, either personally or through the postoffice. Well, he can afford it. For the poisonous anilin preparation with sodium bicarbonate which he baptizes with a hybrid name and which is prescribed by thousands of us yields him a thousand per cent. of profit. And how? It has been given admission to what should be your sacred medical book, the United States Pharmacopeia. That is why you find thousands of doctors and hundreds of apothecary shops with stacks of advertising sheets and quackerish booklets, but without a United States Pharmacopeia or the American Pharmaceutical Association's formulary. That is why a friend found the expensive prescription of a prominent New York practitioner which read: "Remedium Spontaneum, Radway," and which meant no less than merely cheap "Radway's Ready Relief." The same friend took the trouble of examining 50,000 prescriptions compounded in a number of drug stores. Between 1850 and 1873 he met on the prescriptions of physicians no nostrums and no machine-made tablets; in 1874, 1 in 1,500; between 1875 and 1880, 2 per cent. of them; 1880-1890, 5 per cent.; 1895, 12 per cent.; 1898, 15 per cent.; 1902-1903, from 20 to 25 per cent. In a large drug store, one of the gaudy ones, to which the prescriptions of our fashionable doctors are sent, I was assured that 70 per cent. of the prescriptions sent in by reputable physicians contained either nostrums pure and simple or as a part of a compound.

Perhaps it would lead too far to examine all the reasons for that demoralization. But one of them should be generally known and appreciated, which is that there are very few medical schools a graduate will leave, diploma in hand, with the knowledge and practice of writing a prescription. Our medical schools neglect their duties by thus omitting to teach the art of medicine in combination with what is exclusively and pompously called "science."

Let the schools remember what every one of us general practitioners can tell them that medicine means both science and art. I have here the prescription, dated April 14, 1906, which was given to a patient, who swallowed the stuff, by the professor of pharmacology and therapeutics in one of the great universities between the Atlantic and the Mississippi—very far from the Mississippi—which is a mixture of scientific and queer language, viz., "Bili-salol"—what is bili-salol in the Pharmacopeia?—"0.25, dentur tales doses No. C, three to five pills after meals three times a day."

If there is so much proprietary medicine prescribed, and so much quackery, clear your own skirts, professors and doctors. The quacks and manufacturers smile at our unctuous words and unclean hands.

NIHILISM AND DRUGS

The mutations of therapeutical principles, or theories, or notions which have taken place in the course of consecutive centuries, mostly in their connections with mere empiricism, or gradually developing chemistry or philosophical systems, are so numerous as to preclude their consideration, except in voluminous historical study. Today, however, it is my object to claim your attention—important to men both scientific and practical—to the question of the value or uselessness of drugs in the treatment of the sick.

In our time it has been answered in contradictory ways, both by flippant arrogance and by men of honorable ambitions and great genius. The practitioner, relying on the conscientiousness of his purposes and guided by the necessities of his patient as well as by the confidence he places in the judgment of those in positions to experiment and to discriminate, and to teach, should not be blamed when now and then he wavers in his convictions and mistrusts his own observations.

On the foundation of the French school of pathological anatomy, the Vienna school of medicine was established about seventy years ago. Its main creators were Rokitansky, who claimed that pathological anatomy was the essence and sum total of medicine, and Joseph Skoda, who cared for the physical diagnosis of an organic anomaly, but not for the patient. It was all care—such as it was—but no cure was seriously tried. Thus, in Vienna, the ideal patient was he who was satisfied with being auscultated and percussed by Skoda and autopsied by Rokitansky.

The callously scientific atmosphere of Vienna spread far and wide. In Cracow, Dietl, the professor of medi-

cine, proclaimed as late as 1851 his and many leading men's convictions in the following words:

"Our practical work does not compare with the amount of our knowledge. Our ancestors laid much stress upon their success in the treatment of the sick; we, however, on the results of our investigations. Our tendency is purely scientific. The physician should be judged by the extent of his knowledge and not by the extent of his cures. It is the investigator, not the healer, that is to be appreciated by the physician. As long as medicine is art it will not be science. As long as there are successful physicians, so long are there no scientific physicians. Our power is in knowledge, not in deeds."

In the first years of his glorious and honorable career even Wunderlich shared these opinions, but in the first years only; while about the same time Oppolzer, as modest as he was—and is—famous, and as humane as learned, judged the doctor according to the good he would do the sick through his knowledge and endeavors.

Under the influence of the icy atmosphere of Vienna science, Oliver Wendell Holmes said (1860), in his *Currents and Counter-Currents:* "Throw out opium and a few specifics which our art did not discover and is hardly needed to apply, throw out wine which is a food, and the vapors which produce the miracle of anesthesia, and I firmly believe that if the whole materia medica, *as now used,* could be sunk in the bottom of the sea, it would be better for mankind and all the worse for the fishes." This facetious outbreak of the great humorist, who was a popular teacher of anatomy and a studious observer of the contagiousness of puerperal fever as early as 1843—before Semmelweis laid the foundation of his immortality—but was no pharmacologist and no practitioner of medicine, has been quoted numberless times by men who thus believed they ranked with Holmes while imitating or adopting the grave mistakes of his scurrilous and sarcastic mood, and with Astley Cooper, who is quoted by Holmes on account of his remark that more harm than good is done by medication. If he be correct—let us assume it for the sake of argument—the only and simple

thing to be done by him and by me, and by you, is to omit the harm and do all the good we can, and are expected to do, both by medication and otherwise.

After all, however, we meet with succour from our friend the adversary. With all the inconsistency of a poet's flights of imagination and instability of impressions, Holmes expresses himself as follows:

"It is not of the slightest interest to the patient to know whether three or three and a quarter cubic inches of his lungs are hepatized. His mind is not occupied with thinking of the curious problems which are to be solved by his own autopsy—whether this or that strand of the spinal marrow is the seat of this or that form of degeneration. He wants something to relieve his pain, to mitigate his anguish or dyspnœa, to bring back motion and sensibility to the dead limb." You notice the poet takes wings and descends from his Olympian clouds to the earth inhabited by men and women and children, oppressed by human sufferings and looking for humane relief.

Dietl spoke in 1851, Holmes in 1860. The year 1907 brought us disquieting tidings from one of our brilliant, erudite, honorable and—alas—poetical clinicians, whom we shall always be proud of claiming as one of us, as an American. William Osler is charged by the telegraph and by the magazines with having said in an official address to London students:

"Be sceptical of the pharmacopeia."

"He is the best doctor who knows the worthlessness of most medicines."

"Study your fellow-men and fellow-women, and learn to manage them."

Within a day that message flew along the wires of the globe. Millions of practitioners were pained; people were startled.

The *Evening Post,* a lay journal, said of this array of categoric imperatives as follows: "Here we have three trump cards placed squarely in the hands of the Barefoot, Sunshine, Barleywater, and other curists, the New-Thought health-givers, and the sufferers from various

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forms of religious mania." Dr. Osler probably used "sceptical" in its original sense of "examine and test," but we are pretty certain to have the dictum popularly translated—"the pharmacopeia is a fake"; the "worthlessness of most medicines," will become "medicine is worthless"; and "learn to manage men and women" will become the motto of the Pepper-Vanderbilt school. Besides, the *Evening Post* says: "Doctor Osler seems bent upon becoming the terrible infant of the profession."

We owe much knowledge and inspiration to his writings. Both by merit and accident he has reached a platform of his own where every word of his is greedily caught up by hosts of reporters and repeated by legions of pupils. Such a man should beware of any incautious expression which, having once passed over his lips, he may wish to recall but cannot. Nevertheless, however, he—unconscious of the intellectual havoc he has caused—turns to other audiences talking both fun and wisdom, and distributing earnest words and kindly smiles without being aware of having given recognition and food to the lazy and hypocritical. Imitators and followers he has in all classes—deservedly so. This is why I wish to clear him of a blame he merits as little as the obloquy he was exposed to a few years ago at the hands of a sensational reporter and a credulous public. Those who read his book are aware of the extent—large or otherwise—of his therapeutics.

We have always been anxious to secure to every individual practitioner the right to treat his patient according to his knowledge and conscience. That is appropriate in the case of the lowest of us, and must be conceded to those who walk on the summits, even though they reach the clouds.

What I read in his crisp sentences is this:

1. Be critical of the Pharmacopeia as of everything else.

2. He is the best doctor who knows the worth and the worthlessness of medicines.

3. Study your fellow-men and fellow-women, and learn to serve them. "Therapy" means service.

I wish he had said that.

It has become popular to traduce the administration of drugs by calling it polypharmacy. Webster and Dorland define this word as "the administration of too many drugs together," or, of "too much medicine." The adverb "too" begs the question, so that the man who uses it against you should have no standing in court.

Even a very erudite and at the same time practical man —I mean one of us, Dr. Gilman Thompson—makes the mistake of emphasizing self-evident things, and charging us with methods nobody must plead guilty of. In a late paper on "The Treatment of Pneumonia," he summarizes as follows: (1) "Good nursing and the exercise of constant watchfulness should outweigh polypharmacy and specifics." (2) "Do not crowd an overloaded heart with *too much* stimulation, and base the selection of the proper variety of cardiac stimulant on the existing balance between the conditions of vascular tone and the effort the heart is already making." (3) "Expectorants are useless, *as a rule.*" (4) "Prescribe proper intervals of rest in which the patient is free from incessant efforts at medication."

This means what? Do not wake a patient from a healthy sleep; do not insist upon too frequent examinations; do not be guided by the clock, but by your brains; do not be seduced by the excesses of a dosimetric quarter-hour medication theory, simply because it is absurd, and do not exhaust your patient. You always knew that unless you give him the temporary rest required for restoration, you prepare him for the eternal rest. No rule will teach common sense to a doctor who has not learned enough to know he is no doctor and who should have become an undertaker. The word polypharmacy contains a reproach to which nobody will submit.

Even good journals like the *Boston Medical and Surgical* (vol. 155, p. 101) produce such commonplaces as these: "A healthy scepticism should take the place of excessive faith"; "medical practice is not confined to the administration of drugs"; "compound prescriptions are rarely desirable." The unsophisticated are easily im-

pressed by such dicta, which are either unmeaning or self-evident. The inexperienced and lazy should rather be admonished to learn how to find indications and how to write a compound prescription when it is demanded, after his college has, like some others, neglected its duties to teach him. He should know the indications for the selection of drugs, as he is expected to know the rules for ordering diet, water, electricity, heat, cold, and massage —aye, even the placebos of consolation and hope. Surely I prefer them to the prediction of an imminent fatal termination, according to the dictates of our aggressively brilliant Richard (Cabot) the Lion-hearted, of a neighboring state. Unless the practitioner knows and does all that, he drives his patients to the manufacturers, the proprietary medicine vendor, the Christian scientist, and the rest of the quacks.

By the purists among us, who are seldom practitioners, mostly philosophising platform reformers, polypharmacy is called even the prescribing of more than one medicine at the same time. It is claimed by many as a principle that there must be only one drug in a prescription. One of the alleged reasons is that if there be two or three there may be incompatibility. I beg to suggest that drugs, when incompatible, should not be mixed; chemical decomposition must be avoided, and the practitioner should know—and mostly does know—how to take care of that patient of his. In most cases it is easy enough; in some it is not even necessary to be absolutely strict, for you know that, in spite of your schoolbook chemistry, morphine and lead, and morphine and gallic acid when mixed are still active. There is no ground for the pedantic demand that two medicines with similar action should not be prescribed together. Even though all your pharmacists were of perfect knowledge and accuracy, on the shelves of the very best of them drugs are liable to lose their efficacy. There is no digitalis, which though gathered in July and in England, and kept in an air-tight vessel, will not deteriorate from month to month. That is why I recommend and frequently practice the combination of such drugs as tincture of digitalis, of stro-

phanthus, and of adonis, or the solid extract of digitalis and of spartein sulphate, or of caffein, on account of either their equal or similar effect. . . . What is your mixed treatment of mercury and iodides if not a transgression of the one-drug rule—not found at the bedside but concocted on the classroom platform. They tell you that by mixing medicines you are liable to cloud your observation. Your observation on the several constituents of a mixture must be made before you approach your individual patient whom you are called to benefit. That is what the conscientious physician has been doing in his lifelong work. He claims no right to experiment on his patient or on any other human being.

There are three great classes of medical men—those whose domain it is to work in the pharmacological laboratory; those whose opportunity for rational experimentation is at the hospital bedside; and those more numerous and still more directly and practically useful than any of the rest. It is they who are to be the preservers of families, the saviors of individual lives, of trusting sufferers. Indeed, you will yet occasionally meet laboratory searchers who know and admit that the cream of the medical profession is the army of hardworking and conscientious general practitioners, and that the statesmen in the profession are found in the ranks of the general clinician.

You have been told that the one-drug rule cannot be contested; surely not when you deal with a specific case. A malaria fever must not be treated with a plurality of medicines. Is not quinine its specific? Surely it is in most cases. *But* if you strike a case that is *not* simple, but of the cachectic type, complicated with anemia, with swelled spleen? with obstinate constipation? with chronic myocarditis? with valvular disease? those that come from Jersey, from South Brooklyn, from Russian Poland, from the shores of the Theiss? or those that exhibited all the traces of cachexia without ever a chill until the first big dose of quinine was administered. Does the one-drug gospel object to giving arsenic with your quinine? or, when in old cases of neglected infection with

enlarged spleens quinine and arsenic are not successful, to adding or temporarily substituting ergot?

These fifty years, taught by Dr. Francis Simrock, an assistant in the emigrant hospital at Ward's Island, I have thus utilized ergot in seemingly incurable cases. Or when you give quinine or arsenic, or both, and meet with a low hemoglobin percentage, will you dare to withhold iron? or a vegetable purgative in obstinate constipation? or digitalis in a complicating valvular disease? or caffein or theobromin, as the case may be, in myocardial incompetency? Remember you treat no disease nor a Greek name, but a diseased man or woman.

There are those who dislike a prescription blank filled with three or four remedies, but there are also those who dislike the looks of a patient whose many ailments should not have to wait for the gradual and slowly conservative administration of drugs that could as well act simultaneously and conjointly, and better when conjointly. Indeed, when you treat adults they have, as a rule, more than one disease. It is infants and children only that yield a single uncomplicated diagnosis. The disease of an adult has a long anamnesis and the residue of previous illnesses. By insisting upon giving a single remedy, you may care for and cure the last affection, and let your patient slip away from you under expectant treatment.

Only one drug! Are you also required to restrict physical treatment to one method? When you treat with a medicine anemia or feeble circulation? or constipation with cold water, or hot bathing, or massage, or electricity, will you *prescribe* one, a single one, and *proscribe* the rest? And indeed, when you mean to feed a man on 3,000 calories, you might just as well order a uniform single food, merely because it contains proteid and carbohydrates enough to suit your prejudiced pedantry. You know and do better; you change off and mix, you also know that the one-drug demand is not a wise one, but a wiseacre rule.

In connection with malaria I used the term "expectant treatment." Expectant treatment is called the method of waiting for urgent indications. It finds its justification

or explanation in the fact that deaths are not frequent compared with diseases. Indeed, there is a death in 35 cases of illness, contrary to the syllabus of Dr. Sam D. Dickson, of 1845, which teaches that the tendency of all disease is to death. Another alleged reason is the self-limitation of diseases, which in our country has been the teaching of Bigelow (1860). The same Bigelow, however, demands careful treatment as the first duty of the practitioner. He knew that a scarlet fever may last six weeks and run its self-limited course, but he knew also that death may step in at any period unless prevented by active treatment. A typhoid may run its three or its six weeks, perhaps no more; but a typhoid supinely left to itself may prove fatal from many causes. A whooping cough limits itself in three or five months, but it limits not only itself—it may also limit the child unless it be relieved as soon as possible by medication, the best of which is still—as it was fifty years ago—belladonna in ample doses. For every week's duration that could have been avoided is an opportunity for broncho-pneumonia, or a hemorrhage, or a convulsion. One child whose hourly convulsions I combated by chloroform for three successive days thirty years ago, is still alive with an unimpaired brain, waiting for his unknown death certificate at some future day. Let him wait; I don't care. Expectant treatment is best elucidated in some of its phases by a few cases.

I saw a baby lately. She was ten months old, had a fairly normal intellect, two teeth, good bones and muscles, *but* the contractions of a spastic encephalitis. Her doctor had her examined by two of our justly famous physicians, so-called specialists. Treatment? "Let me see her again in six months." We stopped this expectant treatment. She was presented again after a regular iodide administration, and systematic bathing, and passive movements and scientific massage—markedly improved within six weeks.

A baby of six months was presented with his 15 pounds in weight, pale skin and conjunctivæ, flabby muscles, constipation, soft fat, placid though languid appearance, no

trace of teeth, and low hemaglobin percentage. Treatment—expectant. I was told that the doctor had said all would be well after the teeth would come out. Expectant treatment is too often a compound of indolence and ignorance. The latter is exhibited in not knowing that the accumulated iron of the newly-born baby's blood decreases from month to month, that milk contains very little of it at best, and that a human mother's milk may be more frequently defective than that of a less impressible animal. Actual treatment: add cereals and a daily dose of beef broth to the milk, the doses of which were reduced. Open windows by day and by night. A daily warm bath with lively friction to stimulate the cutaneous circulation and thereby the circulation in general, also drugs—strychnine ½ milligramme and iron 2 centigrammes daily. The actual treatment of a month proved superior to the persistent expectancy.

The waiting for the first teeth, procrastination until the seventh year, hope for changes about puberty, promise of improvement about the menopause—have you not met this expectant treatment, with all its pusillanimity and neglect? The underweight child of four or six years is not treated for his latent tuberculosis or his dormant syphilis; the girl with undersized heart and small arteries is permitted to glide into an incurable chlorosis, the woman of forty to totter along with her pernicious anemia and flabby myocardium. Expectant treatment! Verily, I tell you, it is malpractice, which should be punished on account of neglecting what nature and sound therapeutics furnish—the use of cold water and fresh air, and selected food—the cheapest is mostly the most effective—and cod liver oil, iodine, mercury, arsenic and strychnine. Expectant treatment is not treatment. It is the sin of omission, which not infrequently rises to the dignity of a crime. A woman of 46 years presented herself exactly four days ago. She had been under the care of her doctor these six weeks, and taken medicine all the time. He boasted the medicines were mild, but had the great courage to tell her that if she did not become well soon he would make an examination of herself and her urine next

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week. The urine had not been examined. It consisted to a large degree of pus, rather fetid, with many renal epithelia. The abdomen, which she had complained of, had not been examined. She had a big tumor, a renal abscess of the size of a child's head. She has since taken her iron in the shape of a surgeon's knife, and is no longer under expectant maltreatment.

You may ask me why I refer to this case of criminal neglect. Firstly, because its like is frequent; secondly, because it shows to what extent—by false teaching, by the mere doctrine of the self-healing of disease and of the frequent incompetency of ill-selected medicines—the average man may be rendered callous, both in mind and in morals.

A few days ago there came a man of 39 years. Double heart murmur without increased impulse; murmur, posteriorly, faint only. No increase of size of the heart, but a liver reaching down to within 2 cm. above the umbilical level. You recognize in the last two symptoms a few characteristics of chronic myocarditis. Impossible to walk up a flight of stairs or three blocks on level ground. Expectant treatment! no medication, permission to drink his four cups of coffee and smoke four cigars a day. Actual treatment for the next month: rest in fresh air, a cold wash and brisk rubbing daily, no tobacco, no coffee, a mild saline purgative daily, trinitrin and codein in small doses. Probably I cannot change him into a Samson, but I can render his life, not without drugs, however, endurable and more useful. More expectant treatment! I need not say here that not every fever is beneficent through causing the formation of antibodies, and that an excess of bodily temperature is frequently a cause of dangerous disintegration of tissue—mainly of the heart—and in infants the origin of convulsions and of direct or indirect death. It is not necessary to teach here the indications or contraindications of cold air, or of the administration of cold in ablutions, bathing or packs, or of warm bathing; none of them, however, is a panacea. In their place, or with them, a coal tar preparation—unless it be acetanilid, detestable, although it has been smuggled

into the pharmacopeia—with or without a cardiac stimulant, may be life-saving. Expectancy means loss of time and opportunity.

Expectant treatment in sepsis in general—in diphtheritic sepsis, in particular. Those of you who have seen it in bad epidemics remember its main features—the foul odor from nares and mouth, the colossal glandular swellings, bloody and serous nasal and pharyngeal discharges, erosions, petechiæ or hemorrhages, unconsciousness or coma, and—unfortunately—no increase of temperature. You know that these are the cases that leave you and your antitoxin powerless, and the only possible salvation is in local antiseptics and energetic stimulation. They die, all of them, unless some are saved by a drug. That drug is alcohol. Bacilli and cocci and toxins do not engage in a playful game, they mean killing business. So you had better not play with your antidotes. No dose of alcohol —internal, subcutaneous, or rectal—administered intelligently, is too large. No dose will ever intoxicate, so long as the sepsis is not conquered by daily doses of five, ten, fifteen ounces of whiskey—properly diluted—given to a child of three or five years. Do not let up on whiskey before sepsis lets up on you. No matter how successful the most modern treatment with pyocyanase may prove in cases not reached by antitoxin, it appears that the alcohol treatment is still indispensable in the worst form of diphtheritic sepsis. (*Munich Med. Woch.*) Rudolph Emmerich claims as one of the beneficial effects of pyocyanase—the result of bac. pyocyaneus aureus—its power to reduce high temperatures. The saddest of diphtheritic forms, however, have a nearly normal or even decidedly subnormal temperature.

Expectant treatment: A case of rheumatic polyarthritis—thousands of such cases all over the country. Young man had a number of such attacks, severe or slight, and more endocarditis with every one. Mount Clemens is good for "rheumatism," so is Sharon or Richfield. Next summer you will go up and take treatment. Meanwhile what happens? the secondary cardiac enlargement and hypertrophy will grow, and anyhow there may be a new

attack of rheumatism. Then my expectant doctor has a new job. When he is called or pays his visit a day or more have gone by and he prescribes salicylates. Maybe he knows salicylates as well as you and I, but he does not know what to do with it. Indeed, if two do the same thing, it is not always the same thing. When a patient has had rheumatic polyarthritis once, it will probably have him again. Such a patient must never be without his sodium salicylate on hand, ready to be taken without delay. He must take a few doses as soon as he feels the slightest sensitiveness in a joint, and stay in bed perhaps a single day only. That is the way to escape three or six weeks in bed and a new endocarditis; also to avoid the misuse of an honest drug—and the belief and its public expression in a poor innocent journal—not that you do not know *how to employ* a drug, but that the drug is useless.

How many cases of pneumonia have I lost these fifty-four years? I might tell by counting death certificates. How many have I saved? You know I cannot tell, for I am not aware of how many would have got well without me; but when the feeble and arhythmic pulse-beats rise in undue proportion to the number of respirations at an early date, you may feel sure the heart will give out before it is time, for either crysis or lysis. Expectant treatment means neglect, and loses the game.

These endangered hearts demand help. Digitalis, strophanthus, spartein, camphor, caffein, strychnine, ammonia, musk—they are required according to the indications, and by employing some of them, you may succeed in keeping your patient alive until he can get better.

Are there other things that may be required in a pneumonia? We are told often and by many that no opiates must be given. And why not, when sleeplessness and exhaustion are threatened by an incessant cough? A single dose of opium that provides a sleep of a few hours may save the life of your patient and spare his doctor the self-reproach of expectant treatment permitted at an improper time. There are other cases in which drugs are positively life-saving—for instance: pneumonia of the second or third day, with vast infiltration, which exhibits cyanosis, begin-

ning pulmonary edema, and dilatation of the right auricle and ventricle far beyond the right margin of the sternum. With or without a venesection you may save your patient by big doses of a drug. Apply ice, give of fluid extract of digitalis, 10 to 12 minims in one dose, and repeat it once or twice within a few hours. Nihilism or drugs, you have your choice and your responsibility.

Great successes are not always dependent upon big doses. As small meals, well selected and repeated regularly, improve metabolism and nutrition, so small doses of digitalis continued indefinitely strengthen the poorly innervated heart muscle, facilitate compensation in chronic valvular disease, improve, by its very effect on the arteries of the whole body, the heart muscle, and regulate visceral and universal circulation and nutrition. Small doses of digitalis, three to five grains every day, or their equivalents, may therefore be given in chronic anemia, chlorosis, and chronic tuberculosis —alone, or according to circumstances, with iron, arsenic, or nux. A treatment of that kind may be continued many months and years, uninterruptedly, without such cumulative effects as arhythmia or vomiting. Its effect on the circulation in general is rather favorable on account of the improvement in gastric and hepatic circulation. They say we owe the knowledge of this beneficent method of employing digitalis in small and persistent doses, a few daily, to the Germans, like many other things which we are always glad to attribute to them. Indeed, it was Groedel who favored the method and mentioned it before the German Congress of Internal Medicine, in 1900. He was not at all applauded until one or two years afterward Kussmaul and Naunyn reported a few favorable cases. Now it is called Groedel's method. It will reach America pretty soon. But after all it was not a product "made in Germany." If you want to learn all about it, both its theory and its application, and all the particulars, you will find them in the Transactions of the Medical Society of the State of New York, of 1884, in an article entitled, "Arsenic and Digitalis in Chronic Pulmonary Tuberculosis."

Which, as a general rule, are the doses of medicines? Nothing is easier than to be misguided. Minimum and

maximum doses are forced upon you in text-books and pharmacopeias with refreshing coolness. Hundreds of times I have been called up by a druggist who informs me that he has been told the dose of spartein is one-quarter of a grain. I reply that may be the dose of the man who is to be drugged with a placebo, but that my patient requires his one-half or one grain dose six or eight times a day. The average dose of fluid extract of digitalis is set down as one minim; those cases which require ten may get well with ten, but surely die with one.

Dosage depends upon sex, age, body weight, the stage of sickness or convalescence, on high or low temperatures, on the conditions of the absorbing tissues, on the locality of application, on the amount of blood circulating in the vessels, on the presence or absence of sepsis.

Age: The text-books tell us that a nursling must have a fifteenth or a twentieth of the dose of an adult in proportion to their body weights. I do not insist upon giving too large doses of drugs, but at least I do not gloat over big doses of expectancy. I try to give proper doses, for instance, of corrosive sublimate in diphtheria and some forms of sepsis. One thing I am aware of, as my experience in a thousand observed cases has taught me these thirty years—that a baby of six months will take from one-half to one milligramme of corrosive sublimate every hour, diluted in ten thousand times its quantity of water, and continue sixteen such doses daily for several days, and not be punished with stomatitis, gingivitis, gastritis, or enteritis. At any rate the baby will take one-fourth part of a grain of corrosive sublimate, or more, for several days in succession. The worst part of that practice is that now and then a man and brother will throw up his hands in horror, wonder, and acceptance successively, many times. Its best part is that it has helped me and many friends and pupils in curing many cases of diphtheria—particularly the laryngeal form.

Locality: A small dose of morphine administered under the skin just over a pleuritic or peritonitic pain acts much more quickly and effectively than the same dose in the arm. The latter locality is quite easy for a lazy doctor—I mean

nurse—but for sound reasons an abomination to the patient. It acts five times more quickly and satisfactorily than when given internally, much better than in suppositories, whose absorption depends on the condition of the rectum, filled with feces, beset with dysenteric or other ulcerations, or merely catarrhal. A soluble tablet of a tenth of a grain or a few drops of Magendie's solution, more or less, sucked down without water, are absorbed immediately in the pharynx, soothe racking attacks of cough; or when taken a few minutes before a meal, facilitate the gliding of food over an ulcerated tubercular throat, or prevent the vomiting of pregnancy.

During the first six weeks of his life the newly-born has an indolent nervous system. Its reflex actions are defective (Soltmann). That is why reflex convulsions recurring soon after birth are almost unheard of, while those depending on intracranial lesions and hemorrhages are very frequent; and why larger doses of strychnine are required for a spastic effect in the newly-born than later. Atropin, quinine, and nicotin are also required in comparatively large doses in the newly-born animal; and to the same extent opium. And still the books and essays that copy from each other, decade in and decade out, preach the prejudice that opium is incompatible with infancy. Nothing is a more untrue and curious statement. Opium is not to be a daily food, but in a majority of cases of enteritis a baby a year old may take one-thirtieth or one-fortieth of a grain every two hours. The relative dose given to an adult (15-20 times as much) would not be so well tolerated. We read of poison cases it is true, but in fifty-four years of a New York practice I have not seen a single case of opium poisoning of my own making in ever so many thousands of cases of enteritis. Cases of death occur from carelessness or mistakes, very rarely from idiosyncrasy. Such occurrences there are, however. Once I sat up with a gigantic adult to whom I had given a single dose of five grains of iodide of potassium, nursing his pharyngeal laryngeal edema. On the other hand, the same drug is given in daily doses of two drachms to a baby with tubercular meningitis, or the same or a double dose to a syphilitic adult.

As the dangers of opium in children's diseases are overestimated, so the effect of belladonna is not obtained in daily practice on account of the smallness of the doses generally administered. Of the officinal extract of belladonna an adult may not take more than a grain daily without a dilatation of the pupils and dryness of the throat. A nightly dose of one-half of a grain, or a good deal more, however, is required and easily tolerated by a child of four years suffering from enuresis; and the effective dose in whooping-cough of belladonna is measured by its flushing the cheek within half an hour, and not by any book.

The doses of strychnine are controlled by other nervous disturbances. When the splanchnic nerve is injured, or paralyzed by shock, the vast dilatation of the visceral blood vessels is controlled or obviated by large doses of strychnine only. In the paralysis of chronic poliomyelitis the internal administration of strychnine is useless; it will act only in big doses and only when injected into the muscle once every day or two days.

The action of strychnine depends to a great extent on the conditions of the blood, viz., anemia and sepsis. Experience teaches what experiments have demonstrated. The resistance of fishes to the action of curare was found (by Welker) to depend on the small quantity of their blood, which amounts to from 1-53d to 1-93d of their body weight; while in the child there is one weight of blood to nineteen, and in the adult one to thirteen parts of body weight. Ill-fed, anemic, and septic persons, old and young, require big doses of strychnine, in accordance with experiments which prove that a depleted frog demands larger doses of strychnine than those not so depleted; and the depleted side of a frog more than the other side. It is mainly a slow convalescence in man, and thoroughly septic cases of scarlatina, diphtheria, typhoid and puerperal fever, that should be favored with large doses.

Why is it that the confidence in drugs may be easily shaken? Originally their effect was known empirically only. Thus even digitalis was removed from a place in the London Pharmacopeia until Whithering restored it. The action of a deadly poison can be traced at the autopsy;

that of a drug, either active or indifferent, is rarely amenable to that test. Moreover, a bad turn in a disease is readily ascribed to the drug; recovery, to the vigorous constitution of the patient. In the first case, the doctor was guilty; in the other, relieving the patient of his ailment and of his gratitude, he got no credit. Still, the drug is a chief reliance of the physician who moves among the people that have a right to expect to be cured or relieved, and for that end to be supplied with all the healing potencies furnished by nature. Many of them do not retain their reputation forever intact. New knowledge, new fashions, new experience, have altered our convictions regarding cold water, hot water, altitude, and electricity. On the other hand, scores of drugs, in spite of all the obloquy encountered by them, have preserved their standing. Purgatives, both saline and vegetable, exhibit their efforts as of yore, and are credited with them. It is true our forefathers did not know indican, indol, and diacetic acid, and did not look proud, as we do when we spread ourselves with autointoxication and acidosis, but they knew and acted. *Qui bene purgat, bene curat.* Good purging is a good cure. Emetics also deal with us as with our ancient forefathers. We expect a full effect when we either take one or order one to be taken. We prefer the latter. The little girl who told the druggist she would return if it did not work is still unique. Sulphur was known as a disinfectant before Homer; Odysseus, when he had finished the crowd of would-be husbands of Penelope, told the old housekeeper to bring "purifying sulphur." Male fern has not lost its effect these 2000 years. Aloe was extolled by Diosmides and Pliny, podophyllum by the East Indians, rhubarb by the Arabs. Mercury was known to the pious crusaders, and we still bow to it. Poppy's fame has been sung in prose and verse; the glory of iodine, or of quinine, need not be told. The large number of alkaloids render drug treatment more positive and easier. The numerous cardiac and arterial stimulants, which I need not enumerate, and the artery dilators, which relieve the heart, the nitrites, iodides, and aconite have made us more sure of our footing, and our patients more comfortable and safer.

Antiseptic drugs, which have rendered surgical antiseptics and aseptics possible, and the anesthetics which cleared the sky of the wails of millions of human beings and aided the science of medicine and healing by rendering animals painless during experiments, demanded by the interests of mankind, have so fully accomplished their mission that they ceased to be a mere tale of wonderland. Well-known old remedies have expanded their efficiency; for instance, Meltzer has demonstrated that the intraspinal injection of a sterile 25 per cent. solution of sulphate of magnesium—1 ccm. to 12 kilos body weight—produces within 24 hours a paralysis and analgesia of the lower extremities and the pelvic region. The same amount for nine or ten kilos exhibits the same effect within one hour. In this way operations were made without any pain and tetanus was cured.

Sero- and organotherapy have not fulfilled all our expectations, simply because we expected too much, and in too brief a time. But diphtheria and tetanus, hydrophobia and plague tell wonderful stories of delighted mankind. Thyroid and adrenal substances belong to our surest aids. A case of acromegaly, now of nearly twenty years' duration, has changed only imperceptibly these ten years since the woman, about 40 years old, took pituitary substances, with only a single increase of symptoms during half of the past year when she omitted the remedy.

A certain class of institutions has contributed much to the efficacy and the number of drugs. The German Universities, with their numerous pharmacological laboratories, the state institution presided over by Paul Ehrlich, of Frankfort, and the great manufactories of all countries, have contributed to our knowledge. Chloral hydrate, lanolin, cocain, paraldehyde, sulphonal, veronal, trional antipyrin, phenacetin, pyramidon, etc., are the proofs after all that more good than harm comes even from those places among us with which we have ample reason to find fault on account of the vast number of proprietary and quack medicines that swamp the market. But why offer rebuke there while the fault is ours? There are on this floor men good and true who are influenced by the wiles of

drummers, by the outside elegance of their wares, by the alleged convenience of their administration, by the glowing praise bestowed on their action—to recommend them, aye, to prescribe them.

Some years ago Dr. Alfred Herzfeld, of New York, made it his business to look into this epidemic of quack medicine prescribing. He found amongst those of a prominent practitioner of the metropolis, "Remedium spontaneum Radway"—Radway's Ready Relief. He took the trouble to examine 50,000 prescriptions compounded in drug stores. Between 1850 and 1873 he met with no prescriptions of physicians that contained nostrums and machine-made tablets; in 1874, 1 in 1500; between 1875 and 1880, 1 in 50; 1880-1890, 1 in 20; 1895, 12 per cent.; 1898, 15 per cent.; 1902-1903, from 20 to 25 per cent. Personally I have looked over the register of a large drug store in New York. Of 100 prescriptions of doctors in good standing, 70 contained nostrums from all countries.

It is interesting to perceive that Germany, the very land which raised nihilism into power, furnished, without losing its grip on scientific medicine, the vast majority of what is both good and evil in pharmacy and therapeutics, from a proprietary article which has proved live-saving and epoch-making, like diphtheria antitoxin, to other patented compounds, which prove to be down-right quackery. Nor is it the trade alone that indulges in distasteful commercial methods, but the medical profession also. In spite of its scientific ambition and achievements, the ethical standard of the German profession is low. Advertisements of themselves, of their specialties, of the manufacturers' wares, are commonly found in the columns of newspapers and the bulky medical magazines. What we meet with occasionally amongst us here, viz., paid so-called original essays, laudatory of new chemical productions, seems to have been promoted into a system amongst our transatlantic brethren. Indeed, it seems to take the democratic spirit and the civic pride of a democratic community to condemn it. After all, it appears Plutarch was right when he said, that though death kills everything, superstition will survive it.

I might go on at some length exhibiting a list of drugs

that are meant to save, to relieve, to increase your patient's power of resistance, to prolong life, and to make it bearable. While, for instance, biologists here and elsewhere try to discover the etiology of carcinoma as the foundation of a causal therapy, the knife has added to its many triumphs in curing it. Nor is the apparent helplessness of a great many inoperable cases left to its inevitable fate. Von Mosetig, of Vienna, and Willy Meyer, of New York, injected pyoktanin into a cancerous tissue; neither continued the treatment long. I caused great pain in the small number of cases in which I followed their methods since 1891 and 1893. The torture, however, to which I exposed my patients made me change my procedure. Since 1892 I have given methylene blue—methylthionin hydrochloride—internally in hundreds of cases of inoperable cases with such fair results as I have discussed at the Boston meeting of the American Medical Association (*Journal of the A. M. A.*, Nov. 6, 1906).

Nor should I be silent in reference to the drug therapy of chronic tuberculosis. Nearly twenty years, since the late Dr. Schüller's first communication concerning guaiacol, have I employed it in at least 5000 cases of tuberculosis. What I am getting more sure of from year to year, and have published repeatedly, is its reliability, no matter whether it is caused by its beneficent action on digestion, or what I prefer to believe, its direct influence on a probable toxin formed by the tubercle bacillus. While engaged in preaching with a thousand others the gospel of air, and water, and rest, and food, and sanataria, I cannot withhold my constant exhortation that no private, and no sanatarium, and no hospital and dispensary treatment of chronic tuberculosis should be carried on without some preparation of guaiacol.

To prove the uselessness of drugs, they tell you that the older a doctor gets the less medicines he will give. There are, however, old doctors and old doctors. Old doctors have no right to be senile. As soon as they become senile they are doctors nevermore. Advancing years should add to the physicians' success in finding proper indications, and to their knowledge of the action of drugs. Their own expe-

rience should be, and is supplemented and matured by that of their brethren, by the teaching of the laboratories, the clinical hospitals, the writings of their peers and betters. That is valid for the so-called old and the so-called young. For let no man rely solely on his own doings and findings. There are those both old and young who make the same mistakes year in and year out, and call it experience. Let the young and the old men beware. White hair and scores of years are not wisdom by themselves. It is certainly true that in our times, when the means of diagnosticating have grown to a wonderful extent, a young man of 30 or 35, bright, open-eyed, erudite, with an appreciation of all that is new and a recognition of the value of what made our fathers—Sydenham, Boerhaave, Peter Frank, Trousseau, Watson Clark, and Flint, great physicians—should be a mature and experienced practitioner at the time when arterio-sclerosis makes its first gentle appearance. When you meet on old doctor who tells you that he gives no drug, or a young one who was born old, who uses no cold water, no massage—on account of their alleged uselessness—he belongs to the class which remained in the rear away from the battlefield of the army of explorers and fighters, or that unlucky class whose brain was first in the falling victim to insidious atheromatosis. We are human and are all subject to the laws of nature which is indifferent to whether she preserves full manhood in one and makes an object of pity of the other. They say we are wonderfully and fearfully made. Some wonderfully, some fearfully.

A wise man, one of our profession, Peter Frank, confessed a hundred years ago: "When I was young, the sick feared me, since I got old, I fear the sick." But while fearing them, he never ceased to love the sick and place at their disposal what a ripe empiricism and vast experience taught him. What Bigelow proclaimed, as the "leading idea" of the doctor, viz., therapy, was inscribed in Frank's conscience. He appreciated that nature only can heal, but also that by recognizing her power and ministering under her, we master her. That is why we learn that and why nihilism is as conceited as it is impotent;

and why we are convinced of the truth of what Robert Bartholow said in 1876 in an address delivered before the medical and surgical faculty of Maryland: "He who despises his art, can never become a great artist. Good practitioners are always found to be men entertaining the greatest confidence in the powers of medicines." Medicine is more than pure science. It is a science in the service of mankind. We live in the era of therapy; therapy in political, social and individual life.

THE MODERN HIPPOCRATES

Hippocrates lived approximately between 460 and 375 B. C. His biography was written nearly 500 years later by Soranus; he refers to Erastosthenes, who lived two centuries after Hipprocrates, and cannot be proven to be absolutely correct. Of contemporaneous writers who mention him, we know Plato. From him we learn that he knew him, or knew of him, that he lived at his time, was born on the Island of Kos, belonged to the noble family of the Asklepiades, was a physician and a teacher who was paid for the instruction he conveyed, and that he held a creditable position.

Many of the essays called hipprocratic are not the writings of one man, of him whom we revere as the father of medicine. He and his pupils and followers learned from different sources. There was a previous lay medical literature, which was preceded, and followed by, or contemporaneous with, priestly medicine. Hippocrates studied the former and utilized the latter. He expressed the conviction that a large portion of medical knowledge consisted in the faculty of knowing and correctly judging of its literature. In the second book on prognosis he says literally: "Those who are quoted on account of the accuracy of their prognosis I have either conversed with, personally, or I have consulted their writings." The medicine of the priests was by no means mere quackery. Their Epidaurus was a sanitarium in an idyllic country, with a Saratoga of sodü sulphas and chlorid, a bath and gymnasium and a large store of histories of cases, and epigrammatic sentences containing rules of diet and of healing, in addition to hypnosis and suggestion. Many of those epigrams are met with in the Hippocratic aphorisms. On one of the Epidauric tablets is found the first description of the facies hippocratica of the collapsed or dying.

The physicians of those times were also philosophers. Plato, who had such a poor opinion of the practicing physicians—it is true most of them were slaves—that he declared their business as unworthy of a gentleman, pronounced the physician who was also a philosopher to be "divine." And many of the philosophers of renown who studied alongside the human mind, also anatomy and physiology, mainly, it is true, or exclusively, of animals, paid their attention to medicine also, and constructed theories in the essence of life and of disease. In the writings of Hippocrates we meet the names of Empedokles, Melissus, and Democritus.

The latter is known to have made himself inconvenient to his fellow citizens of Abdera. They sent Herodikos to examine him for his mental condition. The psychiatrist asked him what he was employed with. "To study the stupidities of people." Thereupon the doctor pronounced him to be the most sapient of them all.

The pathology of Hippocrates was humoral. A correct mixture of the juices (the blood representing warmth, mucus; cold, yellow bile; the dry and black bile; the moist-corresponding with the four elements of the world, viz., fire, air, earth and water) yielded eukrasia, health, a lack, however, of balance between them; dyskrasia, sickness. Many diseases were the result of mucus, which flowed down (ηαταξζεν—to flow down) into the nose, the eyes, the lungs and the spine.

The anatomy of Hippocrates is very defective. Animals had been dissected before, the living human body was studied in the gymnasia. The brain was not the nerve center, but a glandular body which secreted mucus. Still it was connected with the spinal cord. Nerves and tendons were not differentiated. The heart contained air, "pneuma," the arteries also were filled with air. The pulse was not studied much before Praxagoras. That is why Hippocrates, whom Celsus calls the creator of surgery, never performed a bloody amputation and did not practice the ligature of blood vessels. His amputations were confined to gangrenous limbs on the lines of demarcation. The uterus was bicornis; the males came from the right

horn, the girls from the left. The testicles were not recognized as the producers of sperma. Ovaries were safe at those happy times, for nobody knew of their existence. The knowledge of bones and muscles was extensive. That is why fractures and luxations were treated correctly, operations for caries and sequestra and trephining were frequent, also for cancer, abscesses, wounds of the head and and others, fistulæ and ulcerations. Many operations were performed on the eye in all cases that were accessible to observation. Kyphosis was often treated in methods similar to the modern ones of Calot. Amongst the bandages the mica Hipprocrates is known to-day. Massage was used in clubfoot. Herniotomy was not performed, but he practiced and taught the treatment of hernia, orchitis, parotiditis, the bladder, angina, noma, dropsy, paracentesis, the liver, ileus, epilepsy, intestinal worms such as tæmia and oxyuris. "Kynanche," the obstruction of the air passages, was treated by introducing tubules into the throat "so that air may be drawn into the lungs" (lib. VII. 130). Stone in the bladder had to be removed by specialists.

As anatomy and physiology were defective, etiology became mainly a matter of close and undisturbed observation. Too much food, too little food, meals at improper hours, the interruption of habits, and improper or indigestible food were frequent causes of illness. Loss of appetite was known to be due to the omissions of meals, or irregular meal times. Heredity, climate, season, bad air and bad water gave rise to many disorders, to swelled spleens, and to dropsy. Vesical calculi are attributed to the latter; possibly their frequency was due, as in Egpyt, to the presence in the turbid waters of Bilharzia embryos. Endemics were well known, epidemics ascribed to changes of season and bad air. Warm winds and cold winds were studied in men, women and children, for their influence in causing rheumatic pains, diarrhœa, hemorrhages, abortions, epilepsy, dyspnœa, pleurisy with empyema, epistaxis, and diseases of the eye. A final source of experience were the observations collected in the gymnasium. Plato reports the case of Herodikos, a teacher of gym-

nastics who succeeded in prolonging his life—he was feeble and sickly—by gymnastics. For his success he rebukes him, but admits that he reached an alvanced age through his exercises. Hippocrates himself tells us that his own observations graduate the amount of physical exercise and of the food which is to be taken in appropriate correlation. No person who does not work remains in good health by mere eating. Limbs are strengthened by use, emaciated by inactivity. Untrained people get exhausted by exertions. A sudden transition from long rest to labor is not wholesome. The man who changes from hard and permanent work to rest and luxury, should diminish the demands on his stomach.

Prognosis.—"It seems to me best for the physician to acquire practice in the prediction of the termination of a disease, for when he knows before and predicts the present state of his patient, and the past, and the future, also such things as the patient omits in his report on his condition, people will have firm confidence in him and in his superior knowledge and will entrust themselves to him."

Though the exact scientific method was wanting and special and local diagnoses were not what they are or should be to-day, Hippocrates teaches prognosis on the strength of what he learns through touch, sight and smell and hearing. Succussion was well known to him, the urine was judged according to its gravity, and by the amount of water taken in; empyema which had perforated the lung was favorable when the expectoration was uniform, not offensive, and not attended with fever; but permitted of an ominous prognosis only when offensive and accompanied with fever, or when the probe became discolored by pus. Phthisis gave a bad prognosis when the patient's hair fell out and the sputum smelled badly when thrown into the fire. The prognosis was bad in apoplexy, in uræmic convulsions, in the grinding of teeth with the exception of those who had exhibited it from early years, in the sudden changes of temper which made a formerly modest and manageable patient give snappish answers, in difficult deglutition attended with great restlessness and without swelling, in increased reflex irritability unless the

patient were hysterical, in a slow pulse when attended with sopor; in what is known to-day as facies hippocratica. A good observation is also recorded in connection with a hoarse cough (like dog's barking). The prognosis is bad when the cough is dry, without expectoration, and without swelling. Lately, within the last 50 years, these symptoms, with which was combined the absence of elevated temperature, have been recognized—though accepted slowly—as pathognomonic for pseudomembranous laryngitis in its differentiation from the common form of laryngitis or a diphtheritic or coccic pharyngitis, or rhinopharyngitis.

The prognosis was bad under the following circumstances: sordes on the teeth—perspiration in a feverish patient with no decrease of fever—excessive sleep or sleeplessness—good or ravenous appetite and much eating with rapid emaciation—cold hands and feet and head with a hot trunk—and fever in jaundice.

The science and knowledge of prognosis differ for the modern clinician from Hippocratic prognosis in the same degree as his nosology. Etiology and therapy change the prognosis of individual cases. The duration of an illness, its curability, incurability, and fatality may entirely depend on the power of individual resistance, which is the result of age, previous health, complications, of nursing and medication. Nothing is more deceptive than the determination of a prognosis by the name of the disease. A few instances of what I mean may be acceptable. To what extent pulmonary tuberculosis may be influenced by the management of either the incipient or the advanced stage, we all know. The cases complicated with a mitral insufficiency—which are rare after all—are favorable, those which are found together with pulmonary stenosis—yield a very bad prognosis. Those which run along with healthy abdominal organs, are promising. Urobilinuria, however, and oxaluria are grave symptoms. A pneumococcus meninigitis affords a better prognosis than the tubercular form, or that which is complicated with a cerebral tumor or cysticercus.

A sudden fall or abrupt increase of arterial pressure is

ominous. Sclerosis of the coronary artery may terminate suddenly, that of intestinal arteries may prove fatal by hemorrhage, also aortic aneurism, or syphilis of cerebral arteries which become suddenly fatal through hemorrhage in the medulla oblongata. With the fatality of blood diseases we are acquainted. But there is none of them in which the prognosis should be absolutely fatal. Leukæmia may get well, mainly that which depends on bothryocephalus, Hodgkin, more frequently than leucocythæmia, also pernicious anæmia, though there be megaloblasts, diminution of leucocytes, and poikilocytosis. Infectious fevers permit a cautious prognosis only. Diphtheria, when nasal, is liable to be fatal, unless frequently but carefully and gently irrigated, and its myocardial degeneration has often been the cause of sudden death at the hands of nurses who *will* take the struggling patients up for manipulations, or even without such ignorant criminality. The prognosis of a relapse in a typhoid fever is made by finding the spleen refusing to decrease about the 16th or 17th day. That of whooping cough is rendered doubtful by the neglect of treating it; those of us who cause broncho-pneumonia, or pulmonary or cerebral hemorrhage by our neglect of positive indications, should be punished for their sins of omission.

Sepsis from any source is serious. Streptococci in the blood are dangerous, but not so bad prognostically as staphylococci which give rise to pyæmia.

Thrombophlebitis at any part of the body, both externally and internally, permits of a cautious prognosis only. It requires absolute rest, even when on the lower extremity only, unless you want to run the risk of a pulmonary embolus, and the co-operation of an undertaker. A sudden falling off of a number of leucocytes in a serious illness means a dangerously low grade of blood forming.

Orthotic albuminuria may get well; non-traumatic acute and subacute, unilateral or bilateral nephritis, the former very rare if at all existing, even the tuberculous form, may allow a fair prognosis in instances, and uræmic convulsions every one has seen to recover. Diabetes, though gangrenous, or pneumonia in diabetes, or diabetic coma, may get well, at least temporarily, in opposition to contra-

dictory teaching. Pyelitis, which ten years ago was identified with death, unless it originated in lithiasis, permits a very fair prognosis, mainly in the very young, and whenever it is bacillary rather than streptococcic.

The prognosis of empyema depends mostly on its origin, the tuberculous form is extremely grave; but even that may recover.

The diagnosis of appendicitis should always be combined with a blood examination. A moderate leucocytosis, however, does not always require the operation; from 10,000 to 20,000 have often permitted a favorable prognosis. Extensive ulceration of the colon has lost its terrors since Weir utilized the appendix, which he and his followers implanted in the abdominal wall these ten years for local irrigation. Lately the trans-Atlantic cable and the American newspapers have, in their ignorance or naïvete, eulogized the doings of an English physician who lately performs the same miracles. Dr. Weir will not mind it, he is only an American, and his method will become more appreciated when it returns to him from Europe. Meanwhile it will be Keetly's method; and Dr. Weir may be satisfied with the position taken by one of the very greatest Americans, perhaps the greatest, of all times, Alexander Hamilton. Him Frederick Scott Oliver credits with the realization of the principle that as long as a thing was done it mattered not who was credited with it. He was a statesman, not a politician.

The prognosis of this ulcerative colitis depends to a great extent on its cause; the amœbic is worse than the bacteric, but the prognosis is not absolutely bad in either; for therapy was not absolutely futile, even before Weir.

Be careful how you form your prognosis in cancer. Early operations heal many when they are, and as long as they are, accessible. Cancer of the stomach and scirrhus of the intestines may last years, and permit life-saving or life-prolonging operations. My observations of prolonging the lives of those inflicted with inoperable cancers—presented to the American Medical Association three years ago (*Journal A. M. A.*, Nov., 1906), have been repeated since.

The question of prognosis is not exhausted by the actual knowledge of the morbid process from which a patient is suffering. We have no dealing with a Greek name, but with an individual, whose power of resistance, external circumstances, means and nursing modify what appears to yield an inevitable prediction. That is why a prognosis should not hurriedly be pronounced fatal. Tuberculous meningitis is not always fatal. Cerebro-spinal meningitis allows under the influence of our Flexner's serum of a better prognosis than two years ago without it.

There is both for prognosis and salvation no end of legitimate hope. The combination of exact nosology and inventive surgery has accomplished seemingly impossible results. Sixty years ago an American was held up to ridicule for his report on the incision of an accessible brain-abscess; to-day the apparently inaccessible, large or small tumor, or abscess, is diagnosticated and removed, and the doomed patient is cured.

I have mentioned that staphylococcus in the blood, with pyæmia, is not always fatal. Streptococcus is still less so. The well-informed medical man should be cautious enough not to expose himself to grievous mistakes when asked for a prognosis, and the conscientious physician should be humane enough not to be led by his fears into a sentence of death. Such a mistake was made lately by a most experienced laboratory man. The result was the resort of the otherwise well-informed and well-meaning patient and his vast number of influential relatives and friends to the Christian Science crowd of New York which has enjoyed and utilized this occurrence, until the patient, after an apparent temporary improvement, lost his thinking and speaking powers. Then hundreds of people asserted that he passed his time, a whole week, not in dying, but in silent prayer. He died, but the injury to the medical profession is irretrievable. Many a fatal prognosis, correct or not, has driven the patient into the fangs of the quacks. The loquaciousness of vanity harms both the patient and the medical man.[1] That does not, however,

[1] It will do no harm to remember what Aurelius Cornelius Celsus says: "Diseases are not cured by eloquence but by remedies."

cover the case entirely. The sick, unless deprived of intellect, will not endure being told they have an incurable disease; least of all those who tell you they want to know all about themselves.

Hope is the best stimulant of the nervous and circulatory systems. A few months ago a patient was dragged into my office, after having lost ten pounds in a few weeks and sleep and appetite and digestion and strength. That was when he had been told by his knowing doctor that he had cancer of the liver, and no prospect of a recovery. I assured him he had a tumor, that I could not have him operated upon in his present condition, but that he would be vastly improved by proper medication. So he was; the man who was rapidly dying from his cancer and his doctor, improved, and slept and digested, and walked up to me ten days afterwards. These ten days of encouragement were a clear gain, so were a few more stretches of ten days each. Tell either the exact prognosis, if there be one, or your fears to a reliable member of the family, and another more encouraging to the patient. Encouragement is a remedy, sometimes the best. He may ask you in many a bad case: is he to send for his family, or the absent member? I tell him exactly what you would, viz., that the absent member has a right to know of that illness, or will be offended unless notified, or should be notified at all events, and then be left to his own discretion. He may also ask you whether he should make his last will, or delay. You will answer like myself: What? You have never made your will? I am not a business man, but I have made six different wills in my life, though not in any apparent danger. You should make your will at once; you are strong enough and not superstitious, and if you dislike it in six months, make another one. That is, in my opinion, the correct and humane and practical method of a conscientious physician, who is not merely a medical man given exclusively to diagnosis and the pathological anatomy of the autopsy, but a humanitarian with both medical knowledge and the sense of responsibility towards the body and soul and comfort of a suffering, but hoping fellow man.

In your vocation you have to deal with no crystals, but

with the life of a fellow being. You are no mere naturalist, you are a physician. If you cannot cure, you can improve. If neither, you can cheer, and that is to improve. I said a year ago on this platform: Therapy is service; service is therapy.

You may render a tangible service—that is part of your therapy—by improving your phraseology. You will strengthen confidence in your visitor by not telling him he has "consumption," which to most people means a sentence of death. When he asks tell him he has "tuberculosis," and will not be "consumptive" unless he will get very much worse. Be sure not to inform an impecunious person that he is certain to die unless he leaves town and family this very week. Is there anybody here who doubts that a humane physician would be guilty of that? Perhaps you are correct. But what I have experienced hundreds of times is that medical practitioners committed that brutal error. That is no therapy, no service; it is partnership with a destructive disease. Nor is it a serious loss to your dignity to use in a case of cancer when inoperable in place of the word cancer: carcinoma, or better yet, tumor, or enlargement of the liver, or of the glands; or in place of valvular disease—which has a now and then cruel reputation with many—enlargement of the heart; in place of aneurism of the aorta which will be read up in the cyclopædia, dilatation of an artery. Thousands of years ago Charaqua told you: it is not permissible to make any communication of the imminent death of a patient whenever it may injure him or anybody else.

Hippocrates could not build upon extensive anatomical and physiological knowledge. His guides were the history and literature of his art, close observation of clinical facts, and the sense of obligation and responsibility. Therapy means service. His service was preventive and curative. Diet and hygiene play a prominent part. He dealt with no disease, but with diseased men. That is why, while trying to be the minister of nature, he knew he could be minister in individual cases best by turning master. That is why he relied on active treatment both by drugs

and by mechanical interference. He was not a "no drug" man, nor a "one drug prescription" faddist. He was an all-round practitioner and teacher, though he recognized the specialistic calculus cutter. As it was in East Indian medicine, so was to him the physician without surgery a bird with a single wing. He shunned improper advertisements, though he displays a certain shrewd willingness to impress the people. He was modest, for the phrase "it seems to me" is met everywhere; but also sometimes self-opinionated when he objects to those who differ with him. While being altruistic, he is also pedantic, and while being philosophic in his views and methods, he is no dogmatic philosopher. His diagnoses were not so local as we try to make them—except when external and palpable and visible anomalies or lesions had to be corrected—but often the recognitions of altered universal function.

Such was the head of ancient medicine, the great Hippocrates. From him we have inherited many principles: close clinical observation, both dietetic and active treatment, absence of metaphysical fads, clear description of symptoms and proper service to the sick not guided by preconceived notions or prejudices, and medicine as a unity, which studies the physiological function, its alterations by what we know to be bacteric and other influences, and the changes of tissues; finally humane ethics.

According to this etiology the therapy is regulated. Hippocrates deals with sick individuals, not with sickness. It is only by Plato that disease was given a degree of autonomy, and considered an entity. Hippocrates emphasizes individual etiology, symptoms and diet; the mode of living, clothing, the climate, occupation, and age. He prohibits generalizing and theorizing, and relies on "physis," the healing power of nature. No overfeeding, no underfeeding, no inconsiderate stuffing of drugs. Treat empirically and be guided by symptoms. It was only the school of dogmatics after him that speculated where their knowledge failed; even his very sons, Thessalos and Krakon, and his son-in-law, Thessalos, were carried away by them. Plato had no realistic foundation, and in mediæval

times until a few centuries ago Aristotle was not known except mutilated, and theosophy, neo-platonism and astrology reigned supreme. According to Galen it was only Diokles of Karystos, the same who studied the embryo in the egg, and Praxagoras of Kos that remained soberminded.

It is natural that the Hippocratic mind turns to prevention as a main salvation. The practical value of the book on diet is still great. In acute diseases starvation and low diet and water were recommended. Water seems to be withheld, however, more than to-day we should approve of; still its comparative prohibition agrees with what I remember to have been practiced half a century ago. Occasionally wine was recommended in acute diseases. He did not, I repeat, believe in no drugs, nor in one drug prescriptions, having no text-book to teach him except the traditions and teachings of comparatively a few centuries only, and nature and experience. Enemata are frequent, vomiting is produced by tickling the throat, or by veratrum, which also served as a laxative. Euphobiaceæ were in frequent use. Altogether laxatives were administered extensively. Copper served as a hæmostatic, iron was used as an oxid (rust) only, metals were not used, except externally, until Paracelsus. Barley teas, preparations of honey, vinegar water, milk, wines, warm drinks as diaphoretics, scilla, celery and cantharides as diuretics, meconium as a narcotic are frequently met with. Scarifications and cups were pet remedies, leeches only later; venesections were made near the seat of the inflammatory trouble. In exhausting hemorrhages the head was lowered and the limbs bandaged. He was not afraid, either of allowing nature to have its way, or of relying on spontaneous recovery under the guidance of rational hygiene, or on the effect of mild medication, or effective treatment by drugs or external means. Nor was he afraid, as I have said, of being the minister of nature by temporarily turning her master. He was aware that "what medicines will not cure, the knife may cure, what the knife will not, fire may, what neither will cure, is incurable."

What now-a-days we call therapy comprehends a great many things which must be known and employed unless the sick is to be punished for our ignorance. Medication, which I shall not touch this morning, should be studied as conscientiously as the nature of disease. Its scoffers satisfy nobody but themselves. Medication is guided by experimentation like other parts of medicine, and is engaged in its progress to greater accuracy. That is mainly so since 1876. From that year on, though there were good hypotheses on the microbic nature of disease these 2000 years at least since Varro, many diseases have become accurately known to have a bacterial origin, and sera and vaccines are employed to treat them. Malaria, the tsetse fly and glossina have consented to divulge their mysteries and to show their vulnerable parts. Pasteur has enriched agriculture, industry and sanitation by the same methods. At present, medication may relieve and cheer when advanced tuberculosis, which so often is hopeful to the last, is not improved or alleviated by nursing, or climate, or sanitarium, in your neighborhood, or in a far-away exile. Comfort the sense of annihilation connected with grave anemias, and prolong and ease the misery of a moribund carcinomatous father of a family. Give aid and hope. Do not try to fulfill impossible indications, for instance: The vast majority of my tubercular patients these 55 years have not been millionaires. I have learned that a low-priced attic with no window in Colorado or Liberty is not preferable to an open window in a suburban tenement in New York, and the solitude of a distant institution which takes his last dollar while his wife and children are destitute at home, does not improve the outlook of a man who lacks his accustomed food and a sympathizing eye, and the scanty aids of his poor dwelling.

In our therapy there is no severing of art and nature any more than in ancient Hippocrates. The stimulus given by cold water and friction to local and general circulation and sanguification, the influence of pulmonary gymnastics on abdominal plethora, of the regulating power of the stomach on the action of the heart, the very benefit

derived from the proper recumbent or semi-recumbent or erect arrangement of the body in his couch, the determination of the quantity and quality and timeliness of food, the knowledge of when to stimulate the heart or to relieve it, the selection of either cold or warm applications, are part of one therapy as well as mercury or iodine or opium, digitalis or nitrites. Another part is the utilization in our individual cases of the adjuvant forces which add to our diagnosis and our success. One is the clinical laboratory.

With the ludicrous claim of the narrow bacteriologist who thinks that all medicine is limited to his lenses and reagents we have a great pity. They take the place of pathological anatomy which 70 years ago recognized in medicine nothing but itself. But the clinical laboratory, the best part of which should be established in our own office, aids us in forming the diagnosis without which (in many cases) our therapy is crippled. The other is the help afforded by a specialist when our individual knowledge or art is insufficient. Do not despise it though it may not be the hand of a master which you are able to reach. Great masters are scarce anywhere. But be thankful for the aid given by one though he may not have reached the heights of his art. Crumbs are better than no bread at all. Let us be modest and admit that we may learn and our patient profit from a man who may otherwise be our inferior. Ambroise Pare went a great deal beyond what I here advise, when he said he had some use even for a quack until he could no longer learn from him. Beyond all, however, let us be thankful to the specialist, big or small, who at least upholds and teaches to the unbeliever the advisability of active treatment. I say active treatment, not maltreatment. A conscientious specialist will agree with us, that the warm cavities in which they are being coddled, are better for many a nasal septum and an ovary than a formalin-reeking jar.

Which is the relation of modern medicine to specialism? Specialism is not new, ancient Egypt developed it to a wonderful extent, but neither Hippocrates, and Greece

after him, nor Alexandria would recognize it, with few exceptions. There was not even a separation between medicine and surgery until 600 years ago. Modern medicine, however, has evolved special studies and practices to a surprising degree. Technical skill—that is true—can be attained best by repeating the same labor indefinitely. That is well known and acted upon in manufacturing; ten different men are required to furnish by the differentiation of labor the best style of a needle, or a tool. The result is twofold: an accomplished article, and an idiotic workman. Now, is specialism the ripest fruit of medical service and art? and the realization of profoundness? It is; look at Albrecht Graefe, or James Paget. It is not; look at the thousands of young men who turn to what they consider an easy road to money and reputation after having escaped from a medical school. The submission of patient after patient affords the self-styled specialist a certain measure of dexterity, the gifted amongst them also a greater facility of local diagnosis. Now it is true that one of the tendencies of the 19th century was in the direction of local diagnosis, but local diagnosis is not the quintessence of medicine, and the horizon ascertained through peering into a speculum is not the universe of a circumspect and wise physician. The latter is the modern Hippocrates, the revered head of his calling, the others are those whom Aristophanes and Molière ridiculed. Still they may become useful. But when it seems to take an ophthalmologist to make the diagnosis of a chronic nephritis it is not a great feat after all; his opportunity came because the doctor, such as we, was too obtuse or too lazy. When a peach stone is discovered in the suffering rectum by a proctologist, it required no specialistic acumen; the doctor was too indolent to make his own examination. When half a dozen practitioners treated an offensive vaginal discharge for years, it is their sin of omission in not looking for a twenty years' old rotting pessary, and not exactly the merit of the professed gynecologist. Is there a pain somewhere? They want a nerve specialist. A headache or giddiness? a psychiatrist. An urticaria from over-eating? a dermatologist. An ear-

ache from a sore throat? an otologist. A renal secretion with a urate deposit after midnight dissipation? a genito-urinary man, the same genito-urinary brother, when the urine is pale, which is the alleged proof that the uric acid is retained and demands expelling by a specialist. You could not do it. You know it has come to this that a chronic constipation is beyond your ken and requires a "metabolism specialist." The latter is so naïve—or something of the kind—that he sends you the announcement of his limiting his practice to the disturbances of "metabolism." Abnormal metabolism was diagnosticated and treated in earnest by one of them—it turned out to be a case of pregnancy. One similar to it in a young woman of 21 years was treated by one of the neurologists—it was the absence of the uterus and ovaries. Some of them have gone into partnership with underdone clergymen. The latter publish their neurological associates' names and office hours; they are expected to reciprocate by swelling the attendance upon churches which are no longer filled by sacerdotal eloquence and efficiency. Still they are worse off in other climes. A few years ago a Prussian judge acquitted an unlicensed dermatological malefactor on two grounds; first, because he was ignorant and could not be held responsible for mistakes; secondly, he, the judge, was credibly informed that the culprit had obtained valuable prescriptions from the body servant of a famous specialist and therefore deserved confidence. Will not this judicial wisdom of enlightened Prussia justify what is still revered by equally refined mediæval minds, who still believe in the specialistic powers of saints. St. Agatha restored the milk in the breasts of women, St. Anne cured eyes, St. Judas coughs, St. Valentine epilepsy, St. Rochus the ailments of animals.

The specialistic tendencies in their exaggeration are met with more extensively amongst the public than amongst medical men. When a man presented his child in my office and volubly insisted upon a specialist, I told him that if he were not satisfied with a doctor he might go somewhere else. That is what he meant to do. That is why that same afternoon he turned up in my college clinic

and expressed the wise opinion that I might know about children, but not what was good for me. That you are asked by a new patient about your specialty, is your common experience. One of my friends was asked the same question. What he answered was: My specialty is to treat rich people like yourself. Very many times I hear practitioners complain of having descended to the rôle of an agent for specialists, because their patients will apply for a diagnosis—perhaps not even that—and at once for the address of a specialist. To a great extent it is their own fault, for too often they will tell their patients to go to a specialist for trifles. That happens so frequently that the public looks upon us practitioners as a subordinate class of medical employees, and considers the word "specialist" as synonymous with "superior physician" or consultant.

Great changes have taken place in the short time of 1800 years. Harnack (*Medical Things from Church History,* 1892) reports that in the second century there was a class of exorcists, something like the modern difference between real physicians and so-called nature practitioners. But sensible people were sceptical. The jurist Ulpian refused to admit them to the position of doctors. He felt also doubtful about "specialists," and hesitated to accept them as practitioners under the rules of the law.

When you are criticised or pitied by a specialist, take your dose and let "no dog bark." A few months ago you could read about yourselves in an editorial of "American Medicine," what follows: "Arsenic is excessively and indiscriminately prescribed by practitioners"—that is you and I—"in the treatment of skin diseases, evidence of its frequent and unnecessary administration is too often brought to the attention of the specialist. The practitioner's rule appears to be when in doubt as to treatment, give arsenic. The specialist on the other hand withholds arsenic except when specially indicated." Where in this pronunciamento the necessary grain of salt is wanting, you know at once. Of another class of specialists Clifford Albutt has this: "I know that at certain spas even in

angina pectoris baths are prescribed, but spa reports require for their assimilation more salt than is always at hand."

The teaching of specialties, indispensable for the making of thorough practitioners and of perfect specialists, leaves much to be desired. If they belong to a full equipment, they should be taught by competent men who should be rewarded at least by satisfactory positions. The first medical school which established in America a full professorship for the diseases of children was the New York Medical College, which after its reorganization in 1860, as one of the vicissitudes of the Civil War, closed its doors in 1864. In 1860 the scanty instruction in the diseases of children which was a nominal appendage to that of the ailments of women was entrusted to a professor. He accepted in 1865 a place in the University Medical College and in 1870 in the College of Physicians and Surgeons. In both schools he enjoyed the title of "clinical professor." His function found no further recognition anywhere else but in the newly-found Bellevue Hospital in 1861. When in 1900 he was given the title of Professor, that advancement was only nominal, for it did not convey a seat in the faculty. The first real professorship was established by Harvard, where Dr. Th. Rotch has worked and taught successfully ever since. Many American colleges have since followed the example, in England none except Kings College, which has established full chairs for the diseases of children, the mind, the eyes, the ears, the nose, the larynx, the skin and the teeth. Thus mere toleration has ceased, and full citizenship been awarded to the special branches of medicine, which were utterly neglected in the curricula and so despised that a long time full fledged specialist certificates were given after courses not extending beyond six weeks, at the University of Vienna.

That has changed since. But our young men spend some of their time in vain. I have never been able to see in the almost compulsory fabrication of an "Arbeit," —an effort—much more than the vanity of the head of a laboratory who by printing the painful elaborations of

pupils, believes, or wants others to believe, that he has founded a "school."

In Europe they like to specialize more than we do. They set up a specialty by advertising themselves in the newspapers. The pediatrist, the nerve doctor, the woman's doctor, the skin doctor, advertises himself, his alleged specialty, and office hours. Our ethics are more refined and I believe our results are better. We expect a man first to deserve his position by impressing his peers and the public with his superiority. And I have known men who would succeed best when they minded what Gowers wants us to remember, viz., that "specialism is not exclusivism."

Who is to teach therapy in our schools; the botanist who knows all about the structure and classification of plants, the chemist who remembers the names of eight syllables and tumbles about H and O and N and C in endless combinations, or the physiologist who, while constantly—I hope—experimenting on animals, cannot always gather experience on the human body; or rather the clinician whose occupation is with the sick, and whose workshop is a human living organism? This modern specimen of Hippocrates is imbued with the great principle of his ancient Father: Do not injure. He knows, on the basis of facts and of philosophy, that mere empiricism is sterile, that polypharmacy and polypragmasy are as reprehensible as apharmacy and apragmasy, or as over and under feeding. Our modern Hippocrates objects both to the therapeutic pessimism of the uninformed, or the mere naturalist, and to the optimism of the dilettanti who, mostly in the pay of manufacturers, eulogize the latest synthetic chemical, which benefits the writer and his employer, if not the sick. He is also aware that pharmacology and the clinic have got too far apart from each other.

The ideal teacher knows how to distinguish functional weaknesses from genuine disease, and recognizes the fact that the latter has stages with adaptable therapeutic indications; that a scientific diagnosis can be made on hills and in hamlets, but not without previous clinical and laboratory teaching, and that for city and country we

should know enough and be diligent enough, to do most of our tests ourselves, and not to rely exclusively on the knowledge or honesty of laboratories; that a close study of a moderate number of ordinary cases is best for the instruction of the doctor embryo and not the hustling through wards filled with practically inaccessible material; that the same disease is not the same disease in different seasons, climes, constitutions and ages; that with every advancing decade there are increasing complications of lesions and symptoms, and of diagnoses, simple in the infant or child, which become more difficult from year to year and whose prognosis more problematical—indeed I do not know whether all our rising pediatric specialists have an idea of how difficult a task it is to become a real all-round doctor. The modern Hippocrates keeps his hands clean like Billroth, and cleaner than the ball-room dandy, and teaches how to do much with very little.

Oh! I think I understand what the great clinician, the modern Hippocrates, should be and should teach, knowing what many of us like myself are lacking in universal knowledge and usefulness.

There is, however, more in the great modern Hippocrates than a mere modern doctor. The ancient Hippocrates was a philosopher, the great modern physician reaches beyond the sick-room or the hospital ward into public life. His very spirit enters even the most modest country doctor who pays his attention to the prevention of individual and collective disease. The period of individual health cobbling has passed a century ago, or longer. The great clinician is a sanitarian. He teaches and practices the hygiene of schools, factories, mines, city and country; water supply, architecture, ventilation, the care of endemics and epidemics. But he knows quite well that a single measure is no cure all; that is why, being a great and good physician, he is a good citizen. So was Albert von Haller the Swiss, so was Virchow the German. By adopting and alleviating public cares the great physician becomes not only a benefactor but a public teacher, not only of knowledge, but of morals, of ethics, of responsibility to the commonwealth. One such great modern Hippoc-

rates leaves his vestiges forever, though even his name be forgotten, through his imprint on the brain and the heart of his time. The question whether the physician should or may interest himself in politics, need not occur to him; he is a statesman. Being intimate with the four millennia that built up our medicine, he belongs to many generations and is a citizen of the present era and those which succeed us.

The ethics of Hippocrates is worthy of the best ideals of the physician. That is why the sentence:

"It is unbecoming to enjoy the riches of the Persians or to stop the illnesses of these foreigners, for they are enemies of the Hellenic people," is out of place. This sentence has been quoted quite frequently, but it should also be added that it is apocryphal. There is, however, one sentence which should be the daily intellectual food of the physician: "Wherever there is love of mankind, there is love of the medical art." His ethical teachings are frequently found connected with technical lessons, particularly with his indications for treatment.

"The past must be known, the present recognized, the future predicted and cared for. In connection with the disease there are two indications, either to be useful, or at all events to do no harm. Three factors there are in connection with therapy: the illness, the sick, and the physician. In regard to his art the physician is the minister (servant-therapos). The sick and the physician must combine against the sickness.

"The surgeon requires his sight, touch, hearing, his nose, his tongue, and his intellect."

Surgical work demands the consideration of: "the patient, the operator, assistants and instruments, the light, the location of every person and everything, the hour, the how much, the ways and means, the how and where, as regards both the body and the tools; the time, the procedure, and the place.

"I am of the opinion that we should keep our hands off those who have been totally overcome by illness." This warning contained in the book on "art" does not contradict, as it has been claimed (Th. Beck, Hippocrates

Erkenntnisse, 1907), a rule laid down in the book on "diseases" which teaches to succor with treatment as much as possible those suffering from incurable diseases.

"It is the uppermost duty to cure the patient. If there be different methods to accomplish that, such a one should be selected as causes least anxiety and perturbation. For that is the nobler way and more appropriate for art for him who does not crave improper popular favor."

By far the noblest and most instructive teaching of the ancient sage, who, in this, like other things, followed the example of the reformed Asklepiads, in his "Oath," of which I extract the following. I know of very few historic manifestos equally impressive and touching:

"I shall give my orders according to my powers, knowledge and conscience, to benefit the sick and to defend him against injury and wrong.

"I shall give nobody à death working remedy, though I may be requested to do so, nor shall I suggest anything of that nature; nor shall I give a woman a medicine to procure an abortion. I shall manage my art and lead my life honorably and piously, and commit no wrong or work an injury intentionally, nor perform any aphrodisiac action.

"Whatever, within or out of the practice of my art, I shall learn of the life of people, I shall bury in silence as a duty of discretion. If I shall observe and never break this oath, I may be permitted to live happily in my life and my art, and to enjoy the esteem of all men for all times."

At the period in which Hippocrates taught and practiced, the practitioner was a tradesman, or an artist. He had his shop, his office for consultation and operations. Many appear to have had accommodations for those who could not or would not go home—a medical boarding-house, a sanitarium. He was often assisted by young men, free or slaves. The latter might attend slaves, but no freemen. Bedridden patients were visited at their homes, and the young assistants were occasionally employed as nurses. At first presents were given and accepted in place of pay; they were soon substituted by

money rewards, scant or rich, according to the means of the patients, or to circumstances. There were also traveling doctors, some with irregular routes, others with regular changes, like our climatic and watering place doctors, whose cards and letters of appreciation and thanks are immortalized in your waste paper baskets. There were doctors for the army and navy, for the poor and the towns, just as with us, and probably with still less pecuniary rewards or position. For then as now the profession and the eminent physician were occasionally, from Socrates to Descartes and Kant and Gladstone, rewarded with appreciation and honors, and the individual doctor was mostly liable to be treated by his patient worse than a tradesman. At present—I need not tell you—often worse than a tradesman. The latter asks and receives a *quid pro quo,* the doctor is required to work for no remuneration, or a small one. He that does no gratuitous work, or he who has merely financial gifts, is fortunately rare. Rich doctors are scarce, but gratuitous work is plentiful. Almost every doctor whom I ever knew to have ample means had them before he was a doctor. The accession of these men to our work has mostly been a great blessing, for there are those amongst them who, while not obliged to work hard for a scanty or moderate living, had the faculty and the ambition of making themselves useful in the laboratory and in literature, some also in practice. Though you may be no demonstrative handshakers your heart goes out to them. They raise the average standing of knowledge and of medical ethics in our profession. It is necessary indeed that we should have something to counteract the blighting influence of the commercial spirit of these decades of ours, and of withering poverty, and of grasping greed, in the overcrowded and carelessly invaded profession. And now let me quote, as an excuse, for the sin I am going to commit, our old friend Jonathan Swift, "I write for your amendment, not for your pleasure." What I wish to say in a few quiet words so that no outsider may notice it, is that our skirts are not clean.

One of the means of obtaining a foothold in crowded communities has turned out to be contract and society

practice. In New York City alone there are more than five hundred doctors who either have it or crave it. Competition for such appointments is eager. It might be hailed as welcome if it would result in crowding that feature in its worst shape out of the practice of medicine by forcing men into other walks of life. But what it consummates is the degradation and demoralization both of the public and of the doctors. To earn at the rate of one dollar a year for an individual member of a society, and three for a family, they underbid each other, they coax and flatter and treat and otherwise bribe a society president or influential member. That is why what they arrive at is mutual jealousy and hatred amongst themselves, and contempt and despicable treatment at the hands of their customers or patrons. If they could only remember that the law of nature may be mutual strife, but is also mutual aid, and that what is the noblest of all vocations may be contaminated so as to be the meanest of trades. May the present efforts to efface that stain be successful.

Worse is to be said. There are those in the practice of medicine who demand and take commissions. Do you know what that is? An agent receives it when supplying a new customer. Is it difficult to say who pays it? Is it the employer? Is it the customer? The person insured or a purchaser? It is an indirect tax to be paid by the latter, the consumer, who is robbed in order to sustain a high tariff. Commissions are asked and given from and by apothecaries, truss and bandage makers, instrument manufacturers, even by poor nurses. Do not ask for proofs unless you want to have them. There is also a rumor—call it a rumor—that consultants are called because they offer or grant commissions—that practitioners call their consultant on that condition—a rumor—call it so—that a surgeon is given a case because he is willing or consents to be robbed of a big percentage of his fee, which is raised accordingly. Who is robbed? He? The patient who is unfortunate enough to fall "amongst thieves which strip him of his raiment"? My friends, it is not I that select that word, I found it in the gospel (Luke

13). And in Galen I found a sentence in which he discriminates between robbers and the practitioners. There is also a rumor—call it so—that many of these fleeced and fleecing consultants, medical and surgical, are quite capable, members or adjuncts of faculties and hospitals, and what is still more perilous, teachers of the future physicians of this republic. I love my profession as you do. I want it to be respected and to respect itself. I want it without the blemish of bribery or mendicancy.

In this republic of ours with its freedom and individualism there is much corruption and graft. How does it endure and live? Because outside the centres of population, and of ill or honestly gotten wealth and temptation there is the big sturdy American people, too honest and massive for topheavy giddiness. Thus where is my hope and trust in our profession? In the tens of thousands of upright, honorable, at the same time shrewd and ever learning professional men as represented in the villages and towns, small and big, counties, states, and the union. If those who do not make it a habit of joining us here, if they but knew the advantage I and we have over them; and that what we, or some of us may carry here, is vastly outweighed by what we take with us in scientific gain, and what is more: in moral poise. Fortunately our profession has what is sometimes, in long intervals, met in political life, viz., a man to brighten millions of intellects, and to brace millions of characters. The Lincolns, the Schurzs, the Clevelands are rare, and their bodies are dead, but there is nobody that does not appreciate the presence and power and immortality of their spirit. So in medicine. The one great ancient Hippocrates is dead, so are Sydenham, and Haller, and Virchow. Their minds and labors, however, have fertilized the fields on which the modern Hippocrates has been growing, he and his class. For there is a whole class of them, and by growing in numbers and powers proves that the golden age was never behind us, but before us.

If I were to characterize the modern Hippocrates, it is thus that I should describe him. You who are fortunate enough to live with open eyes and ears, have seen and

heard many of them, or know of them, both here and in Europe; for as medicine has grown and widened, so have her followers and practitioners and teachers.

He loves to behold four thousand years of the history of medicine as at the foot of the pyramid Napoleon's warriors, those of brave efforts. He amasses learning and delights in science; is equally patient and painstaking in study, on the platform and at the bedside; and scrutinizes the patient both for what the sick may add to his knowledge and what he may add to the comfort and welfare of the sufferer. While being searching and exact, he is conscientious and full of pity. He is equally joyful over restored health and over a new fact revealed by investigation guided by erudition and genius. That he will gladly publish; but he is seldom a text-book writer. He enjoys new truths discovered by himself or others; he is no priority hunter and is anxious to give credit. His character is full of simplicity, fidelity and loyalty; loyalty to his duties toward the individual, the hospital, and his pupils. He is the revered teacher of young and old, and a friend to the young colleagues in whom he honors the future of medicine. That is why they feel at home with him though, or because, he is a celebrity on both sides of the ocean. Gossip and low strifes do not reach him. His prototype, old Hippocrates, told him that "disputes amongst doctors cause disrespect of the whole art among the people, so that they begin to doubt the reality of medical art." In his practical work he is nobody's antagonist. His competition is judicious and gracious and guided by the unwritten code of ethics inscribed in his soul. That of the just he invites, that of the unjust he endures with forbearance. Still greater than as a physician he is as a man and a citizen. His eminent place in science and the community he utilizes in the service of the commonwealth. He is its adviser as a sanitarian, who augments for the millions both health and wealth. In that sense, as our modern requirements and responsibilities have grown and persist in growing, his opportunities and labors and his results exceed those of his older brother, Hippocrates of Hellas.

If we cannot reach him, we may try to imitate him. If we cannot be stars, we may try to hitch our wagons to them. If we do not succeed in that, we delight in looking up and admiring them. In connection, however, with our duties and our hopes, we remember two great men, Shakespeare, who makes medicine say: "Who chooses me must give and hazard all he has," and Descartes: "If it be at all possible to ennoble mankind, it will be only through Medicine."

FOUNDLINGS AND FOUNDLING INSTITUTIONS

THE Medical Society of the State of New York having passed, in its meeting of February 6th, 1871, the following preamble and resolutions:[1]

Whereas, Humanity acknowledges the claims of every human being to life and to some degree of prosperity, and recognizes in every civilized country the right of every new-born to be protected and supported; and

Whereas, Political economy requires the saving of a being which has given rise to outlay until and after it can become useful and repay the expenses incurred in its full development; and

Whereas, The moral constitution of society requires that every member of society should obtain a sufficient training of its intellectual and moral powers; and

Whereas, The mortality of infants, being large from natural causes, is three times larger in public institutions destined for the maintaining of infants than in the general infant population; and

Whereas, The Board of Commissioners of Charities and Correction, always willing to be guided by competent advice and desirous of doing their best, have already had a report prepared for them suggesting changes and improvements in the raising of their infants:

Therefore, Be it *Resolved* by the State Medical Society to appoint a committee to investigate and report, in the meeting of 1872, upon the following subjects:

[1] A large portion of the statements and figures contained in this report have been copied from "Report on the Raising and Education of Abandoned Children in Europe, with Statistics and General Remarks," by A. Jacobi, M. D., 1870, and "Inaugural Address, containing a Paper on Infant Asylums," *N. Y. Med. Journal,* January, 1892, by the same author. The former was printed in but a few copies, and is, therefore, not extensively known.

1. The causes of the fearful mortality of abandoned infants in general, and those in large public institutions in particular.

2. The reasons for the giving-up of large institutions, and the success of the dispersing system for abandoned infants, in every country of Europe where the preservative of lives was an object.

3. The causes of the unusually large infant mortality in the institutions in charge of either public or self-constituted authorities in New York City and State.

4. The plans and means for improving the condition of foundlings and abandoned children in New York City and State—

a. During their infancy, when they are most subject to disease and death.

b. During childhood and adolescence, when they require an education sufficient to make them useful members, and prevent them from becoming enemies of and dangerous to society.

The President, Dr. S. Oakley Vanderpoel, appointed Dr. Jacobi, New York; Dr. White, Buffalo; Dr. Dean, Rochester; Dr. Thomas Hun, Albany; and Dr. Hutchinson, Brooklyn, a committee to investigate and report on the above-mentioned subjects.

REPORT

The greatest improvement of public morals in modern times consists in the acknowledgment of the principle of mutual solidarity; the principle that all beings are endowed with certain inalienable rights, and that amongst these are life, liberty, and happiness; and the further principle that protection is due to the feeble. Thus it is that modern history has commenced to solve the serious questions of the rights of color, sexes, and ages. If there be any right belonging to the new-born and feeble infant, it is that of security of life and health. Under ordinary circumstances the care of the new-born infant belongs to the parents or their families; but there is a large number of infants who lack the necessary care and protection derived from their belonging to a family circle. A large number belong to parents sick in hospitals or confined in prisons, or to such as have died without leaving any means of sustenance for their offspring; a large number of in-

fants belong to parents or mothers who are not capable of providing for their entire necessities; another number have been abandoned by their legitimate or illegitimate parents or mothers. All of these categories, especially the latter, have a claim on the aid of the community. Provision for their wants ought to be made in the interest, first, of the children, who have a right to live; second of the community, which has the natural duties of humanity to perform and its own economical necessities and moral requirements to consider. In order to better understand this assertion, we refer to the following facts and considerations:

Of the whole population of the countries of Europe, according to Wappæus, 33.66 per cent. are below fifteen years of age. Thus one-third of the living are consumers only, while they produce nothing at all. Between fifteen and twenty years, when most individuals are still unproductive, very many still preparing for their vocation or trade, are 9.72 per cent. But 48.88 per cent. are between twenty and sixty years, the period of activity and work. Between sixty and seventy years, a period of life which is almost unproductive, are 4.92 per cent., and beyond that age, where unproductiveness is the rule, there are 2.81 per cent. of the whole population. At all events, nearly one-half of the population are consumers only, before they are able to repay society for the sacrifices the community has to bring in order to raise them and render them productive. Thus a sound political economy requires the continuation of life until and beyond the period of full and unbiassed productivity. Whatever life is thrown away before is just as much capital thrown away. Therefore, both social, moral, and political economy insist upon the protection of the life of the newly-born and young infant. Humanity requires it, and common prudence commands the saving of a product after it has been called into existence and has given rise to an outlay of working power. Political economy need not be told that a mother who carries a child does less work than in normal circumstances. To waste the product after it has given rise to expense, which is equal to non-production, is a direct injury to national

wealth and power. Every new invention in medicine and surgery, the forceps, vaccination, chloroform, have been so many means of increasing the national wealth by saving life.

But this is not the only consideration of importance. The lost life is a dead loss, but the raising of unhealthy children, or vicious ones, amounts to a constant injury to society, a perpetual malignant disease eating the marrow of the land. If, therefore, any means are resorted to for saving the lives of, and providing an education for, the abandoned or orphan children, they ought to be sufficient, and amply so. If this duty be neglected, the punishment falling upon a community in particular, society in general, is but just. Neglect of either physical welfare or moral and mental education is equally dangerous.

Insufficient physical development, depending upon incompetent nursing or scanty or injudicious feeding, results in the raising of a class of persons whose presence in society is a dead weight and an eating cancer. Feeble men, crippled women, raised by insufficient measures for the bringing-up of children, will require renewed efforts for their support on the part of society as long as they live. Thus capital is wasted on their being born, nursed, and supported. If they had never been conceived and born, it would have been better for society. As they exist, they have a claim on humanity. When they have facilities to work, society has a claim on them and will thrive through them; not otherwise. Thus raising the poor into healthy and robust persons is a direct gain.

If the moral and mental education of the same class of individuals be neglected, there is more than a mere probability of demoralization being the result. Public order is destroyed by such a population, and public means squandered. Means that were saved in the raising and education of the babies will be required tenfold to sustain houses of correction and State prisons. In 1853 there were, in the bagnios of France, 5,758 persons. Of these 391 had been illegitimate children and 146 foundlings. In the State prisons, of 18,205 inmates, 880 were illegitimate and 361 foundlings. And the same proportion holds good for

all houses of correction. Of 1,300 Frenchmen 1 was the subject of legal punishment, and among former foundlings 1 of 158. Thus, of the foundlings of France, eight times as many get punished by law as the average population.

Thus it appears that the most economical policy consists in raising and educating infants and children into physically and mentally healthy men and women. Money spent on them is easily saved in hospitals and prisons. There is but one excuse for a community for neglecting the obvious duties toward the children and itself, viz., extreme poverty. Therefore, where a special community has but deficient means, the whole people, society in general, ought to hold themselves responsible. Society in general is either benefited by, or suffering from, its constituent parts, and therefore, the care of the individual is a matter of common concern. If there is any meaning in the principle of general solidarity, it includes the right of every individual to a healthy body and a sound education. The equality preached by early Christianity and the doctrines of modern social science agree perfectly on that point, and the shrewdness of political economists has arrived at the same conclusion.

There can be no question about the fact that, as a rule, the life and happiness of little children are better protected at the breasts of their mothers and in the circle of their families when there is a mother alive and a family to which they belong; therefore, it would not be safe for the community to take charge of an infant in every case where the means of either mother or family appear to render the safety of an infant but little doubtful. It is better to aid such mothers or families in the attempt at raising their infants than to relieve them of the entire responsibility in regard to them, for the dangers attending the removal of an infant from the breast of its own mother are the more considerable the younger the infant. They suffer from being deprived of their normal food; the procuring of a wet-nurse is frequently difficult or impossible; when one is found, she may not be satisfactory; artificial feeding will not always be carefully attended to, and will certainly not always be adapted to

every individual case, especially when they are entrusted to attendants amongst the poorer classes; there is less protection from the heat of summer or cold of winter; there is the danger of transportation from one place to another, of individual egotism resulting in insufficiency of care, dressing, and feeding, of the crowding of institutions taking charge of them, and not infrequently the incompetency of pecuniary means in both large public institutions and private homes. The egotism of private individuals has the same unfortunate result which is exhibited by undue parsimony in institutions destined for the reception of the children amongst nations who spend a great deal of their means for other purposes—military displays, complicated custom-house administration, purchases of barren provinces, or the luxury of royal courts. The fact of the occurrence of a large number of illegitimate births in every community, and especially in large cities, cannot be denied; nor is it possible to conceal the other fact, that a number of children are destroyed before the normal commencement of their independent lives. The provision made for the sustenance of the poor has never proved sufficient to relieve the care and sorrow and annoyance depending upon the very existence of an illegitimate child, or of children born in wedlock to parents in very straitened circumstances. Thus it is that abortion, or premeditated destruction of the born child, or rapid or slow destruction by hunger and exposure, have interfered with the increase of population. Nor is it possible to expect that the mothers of illegitimate children should be either egotistic or resigned enough to call for the necessary support for themselves or their offspring, or that they should wish to be questioned about a number of particulars they are unwilling to divulge, or that they should willingly undergo want and hardship, for the only purpose of saving the lives of their children. As this is so, provision must be made for the sustenance of those who have been born, or those whose lives ought not to be destroyed before they are capable of continuing an independent existence. By so providing for the means to save and protect the new-born, the fallen, or helpless, the community will obtain two ends: first, to save lives;

second, to prevent the demoralization of those who will, under certain circumstances, resort to abortion or infanticide. It is true that in former times, in most countries, the facilities of getting rid of the responsibility incurred in giving birth to a new being have been too great. The very fact of the new-born being received without question and investigation has frequently been the cause of the reception of thousands of children born in wedlock, thereby facilitating hasty matrimonial connections, demoralizing the public by the ease with which they could rid themselves of their obligations, and spending improperly the means of the taxpaying community. Still, the very fact that the lives of the children, when not taken care of by the community, had been of sufficient importance to induce every civilized country to make provision for the poor, or uncared-for, or abandoned infant or child, no matter whether legitimate or illegitimate, shows an increase of human feeling and moral development.

The institutions by which this end is obtained are of two different kinds: the children have either been entrusted to private parties, who are expected to take the place of the unknown or incompetent parents, or they are given in large numbers in charge of institutions established for the purpose of taking care of hundreds, or even thousands, at one and the same time.

In Europe two methods of caring for the young have been amply tried. Some of the large commonwealths have adopted the principle that society is responsible for every individual's life and person. They take charge of those who cannot take care of themselves, consequently they do not inquire after the family or mother or father of those entrusted to their care. In France the inquiry after paternity is forbidden by law. In a decree of the French National Assembly of June 28th, 1793, we read: "The nation binds itself to take care of the physical and moral education of the abandoned children. These children are given the name of orphans. Every other designation is prohibited. Every girl that undertakes to nurse her own child has a claim on national subsidy. Every citizen has a claim on the support, by the nation, of his children, in

or outside of an institution." Most of these principles are still valid in France, Spain, Portugal, Italy, Austria, and also in Russia; but the loose manner in which the babies were formerly admitted is partially abrogated. It is a peculiar fact that most of these countries—in fact, all except Russia—are prominently Catholic. They are also those in which the necessity of taking care of the abandoned children was first urged, and principally by clergymen. The humanizing influence of the Catholic religion during mediæval periods is proved by nothing better than by such measures as were taken in favor of the helpless and abandoned infants.

The other method of caring for this class of the population has been called the Germanic or the Protestant. Society, or the State, lost the connecting ideal link of the Church. No common tie, no mutual responsibility. In fact, the German princes first embracing Protestantism did so for the purpose of making themselves independent of the emperor and enriching themselves by secularizing convents. Thus, while the Catholic princes had usually availed themselves of their secular power in the interest of the Church, the Protestant ones used the Church or religion in the interest of their worldly aggrandizement. They succeeded, and henceforth in the Protestant countries the resources of the community were exhausted in the interest of the master, who bound himself to nothing but the execution of his will, was constrained by no Church, and had by no means a feeling of responsibility for the abandoned infants. The State, that is, its proprietor "by the grace of God," refused to take charge of a baby; the mother was declared responsible, also the father, when known in the village or town; and frequent disputes would arise as to where the infant belonged, and only when the responsibility could not be localized the commonwealth at large felt the least obligation. Even when, in modern times, absolutism was broken, the measure for the relief of infants remained almost the same. The claims of every human being to be raised and educated in a humane manner are acknowledged and recognized in such commonwealths only in which the importance of the individ-

ual is sufficiently understood, and the policy of the community is that of justice, equality, and liberty. Thus a republican society only, unbiassed by the self-willed egotism of one individual sovereign, will feel bound to save and rear the new-born, the feeble, the dependent, to his or her utmost capability. Whatever was obtained by the Church in Catholic countries, said Church being desirous to do all it could for the eternal kingdom, the glory of God, and its own power, this, and much more, is done by a republican community, in its own interests, and on the bidding of its own conscience. Thus we find even the community of Hamburg, although strongly Protestant and under the influence of the North German governments, more liberal toward the poor new-born than any of the neighboring communities. The example of Switzerland appears contradictory. Although a confederation of republics, it still adheres to the narrow-minded principle not to relieve the illegitimate infants for the alleged purpose of discouraging illicit intercourse.

The reason is to be found in the fact that Switzerland is not a republic, in the best sense of the term, but a congregate of twenty-two little communities with partially republican institutions, said communities living in almost constant jealousy and envy, hindering each other as much as possible, hating each other's institutions, usages, and religion. It is not much longer than twenty years that the separate dwarf republics were fighting each other on account of religious discrepancies.

We are in possession of official lists and tables concerning the poor children of Hamburg, which we owe, as they have not been printed, to the kindness of Senator Peterson and Dr. Meyer. They will show the method followed out in the care and distribution of infants and children left in public charge, either foundlings or orphans, or illegitimate infants whose mothers are not able to support their offspring, or children of criminals, etc., or of such infants as are given up to the city authorities by their mothers. For every mother has a claim on the city to have her child taken care of. These statistics show that the care of the foundlings does not form a special depart-

ment, but part of the general provisions in the interest of the poor. Illegitimate children especially are not recognized as facts. It is a peculiarity of Protestant Northern Germany that the fact of illegitimate births is hardly recognized. In Prussia this tendency to self-congratulation is so strong that no public houses of prostitution are allowed to exist, not even in the largest cities and under the supervision of the police. How this simple fact is able to improve public morals and official honesty is sufficiently proved by the lists of public girls kept under a sort of superintendence by the police, in the hands of local authorities. I have been permitted to see them, being told at the same time that they were not official, not authorized, inasmuch as an illustrious, elderly lady, connected with the royal family, was probably averse to admitting the existence of illicit intercourse in Prussia. It is but just to concede to the Catholic countries the praise of greater honesty and more practical statesmanship.

The number of farmed-out children of Hamburg under six months was:

1861	80	Of whom died	under	six months,	18
1862	90	"	"	"	20
1863	72	"	"	"	14
1864	80	"	"	"	20
1865	82	"	"	"	25
1866	84	"	"	"	29
1867	90	"	"	"	22
1868	92	"	"	"	33
Total	670			Total	181

The general principle of North Germany holds good for Hanover, both province and city. The mother and father, and, if necessary, the township they or she come from, are responsible for the care of the child. Thus of all the illegitimate children born in the city of Hanover, but few belong to the city and have a claim upon the care of the city authorities. And of the few hundred infants or children in charge of the city, but a small percentage

are illegitimate. Further, of 192 children taken in charge in 1868, but 66 were under a year. Thus the statistical importance of these figures is but very trifling. The smaller the number of nurslings to be disposed of the easier the task. They are farmed out, the babies, if possible, sent to a nursing woman, and usually to the country. The results are, in this part of the country, for the few infants concerned, almost as favorable as for those born in wedlock and raised by their parents. But those who are in charge of their mothers, and are farmed out by them to be brought up by hand, fared very badly. The same industry of killing infants systematically is also known to exist. The police, as our official informant told us, had taken pains to ascertain the places in which a large number of such infants perished.

At Berlin, Prussia, the number of new-born infants abandoned and found is very small, seldom exceeding ten a year. In consequence of the strict law compelling mother, father, village, town, or district to take charge of their own legitimate or illegitimate infants, but very few in proportion are under the care of the community at large. Thus it is that mortality of the illegitimate infants left under the care of their mothers is reported as frightful. There is a sort of superintendence, or rather an attempt at knowing the result of such care; but very little is officially known concerning the exact conditions and mortality of these "Haltekinder," as those infants who are given out by their own mothers are called. Those who are in charge of the city fare better, especially since the rearing of the infants in institutions has been given up. The "orphan asylum" in Strahlau strasse is used at present as a depot, in which rarely more than a few dozen infants and children can be found simultaneously. The infants are farmed out in the city (1,500) or in the country (500) at some distance, some a hundred miles, from the city. After they have passed the time in which the mortality is necessarily large, they are admitted into the "orphan asylum" at Rummelsburg, one of the suburbs, where about 500 children are kept until they are fourteen or fifteen years old. At that age the boys are apprenticed out. The

girls remain another year in the institution, and are taught housework before they are provided with places in private families. A certain superintendence is still kept up. Especially the girls appear to have been well watched. It is known that, of 52 girls discharged from Rummelsburg from 1860 to 1863, 3 became prostitutes in after-years (5.8 per cent.); and of 136 discharged from 1864 to 1867, 6—viz., 4.40 per cent. There are, besides, private institutions containing a larger total of children (800, not infants) than Rummelsburg, with the same object and similar results. A peculiar feature of the raising of the Berlin infants is the combination of official and private superintendence. A large number of benevolent persons about the city, mostly of the best and most educated classes, have placed themselves at the disposal of the authorities for the purpose of watching the farmed-out infants. The whole city is divided into a number of "orphan districts," each containing a number of names of superintendents. Every person is entrusted with the superintendence of a few, usually not more than three, "orphans." These private persons are thus clad with a sort of official authority, and the whole plan is said to work admirably. The attempt recently made by Mrs. Morgenstern, one of the best known and most active ladies in the city of Berlin, at raising infants in an institution, appears to work badly. We have seen her institution in the Belle Alliance strasse. During its first three months in 1869 it had admitted 29 infants. Nine had died, and a few more were almost moribund at the date of our visit. They were all bottle-fed, in a healthy part of the city, in a large garden. It was summer, and the infants were out of doors a great deal. What the mortality must necessarily be in winter time can easily be concluded. Still, the results of the institution, if still in operation, are not known to your committee.

The following are the instructions to the mothers of such children as are fit objects to receive "the advantages of the *London Foundling Hospital.*" The committee of Governors meet every Saturday morning at 10 o'clock, at the Foundling Hospital, to receive and deliberate on peti-

tions praying for the admission of children. Children can only be received upon personal application of the mothers. Petitions must set forth the true state of the mother's case, for if any deception is used the petition will be rejected and the child will not be received into the hospital. No application can be received previous to birth nor after the child is twelve months old. No child must be admitted unless the committee be satisfied, after due inquiry, of the *previous good* character and present necessity of the mother, and that the father of the child has deserted it and the mother; and also that the reception of the child will, in all probability, be the means of restoring the mother to a life of virtue and the paths of an honest livelihood. Persons who present petitions to the committee must not apply to any governor, or to any officer or servant belonging to the hospital, on the subject on any pretence whatever; but they themselves must attend at 9 o'clock on Saturday morning at the hospital with their petitions. All of which will be considered in rotation whilst the petitioners are expected to remain in attendance. No money is received for the admission of children, nor any fee or remuneration allowed to be taken by any officer of the hospital on pain of dismissal; and, indeed, any person who shall be known to offer the same will subject her petition to rejection—the officers and servants of the hospital having been instructed to acquaint the committee whenever such offer is made. The children of married women and widows are not admissible into this hospital. The petition is to be written out on the following plan: 1. Name of petitioner. 2. Place of residence. 3. Petitioner's age. 4 and 5. Day and month on which the child was born. 6. Male or female. 7. Father's name. 8. His trade or occupation. 9. Place of residence when first acquainted with petitioner. 10 and 11. When the mother last saw him (day and month). 12. What has become of him.

A few days after their admission the infants are sent to the country, where they remain until their fifth year. The wet-nurses receive an extra gratification when the child, after a year, is in good health. The death rate in the first year is said to be 20 per cent. Having attained

their fifth year, they are returned to the institution in Guildford street, where they are taught reading, writing, arithmetic, and the English High Church catechism. The girls are placed out, at the age of fifteen or thereabouts, as domestic servants. They are apprenticed to the parties taking them until they are twenty years of age. An outfit of clothes, of the estimated value of five pounds, is given with them, but afterward they are provided with everything, in sickness and in health, by the persons to whom they are apprenticed. These parties must be of the Protestant religion and housekeepers, keep two servants (including the apprentice), and not let lodgings, and give two references as to responsibility. All applications must be made to the matron, at the hospital, on Tuesdays and Thursdays, between the hours of 10 and 2 o'clock; and in case the parties are married, they must both attend to see the girl before the formal application is made to the committee. The girls are not placed with persons living a considerable distance from London, nor with single gentlemen. Indentures can only be cancelled by the mutual consent of both parties; but, from whatever cause the apprenticeship may terminate, clothing to the above value must be returned with the girl. The boys are placed out, at the age of fourteen, generally as mechanics. They are apprenticed to the parties taking them until they are twenty-one years old. A premium of ten pounds, one-half payable on the execution of the indenture, and the other at the end of the first year, and an outfit of clothes of the estimated value of five pounds, are given with them. During their apprenticeship they are to be provided with everything, in sickness and in health, by the persons to whom they are apprenticed. These parties must be of the Protestant religion and housekeepers, and give two references as to their responsibility. All applications to be made to Mr. Twiddy, at the hospital, on "Thursdays and Fridays, between the hours of 3 and 5 o'clock."

The whole doings of the "Foundling Hospital" of Guildford street are summed up, for one year, in the following figures:

Children remaining, 31st December, 1867	463
" received in 1868	63
	526
Imbecile, deformed, or invalid adults, etc., supported by the hospital, 31st December, 1867	15
Under training at the Home and Colonial School Society	1
	542
Children apprenticed or placed out in 1868	30
" restored to their parents	2
" died in the country	14
" remaining in the hospital on December 31st 1868	295
Children at nurse in the country	185
	526
Imbecile, deformed, or invalid adults maintained by the hospital on December 31st, 1868	12
At the Training College at Brighton	1
Removed from the list of invalids, and supported out of the Benevolent Fund	3
	542

At the termination of the apprenticeship the institution considers its mission as ended. If the children have gone through it with credit, they are to receive a premium of five pounds, a prayer book, and the order of once a year to say a prayer of thanks in the chapel of the institution. Sickly and feeble ones, who are unfit to learn a trade or business, are supported by the hospital funds, and are employed as servants in the hospital.

Reclamations are but very rarely allowed. As soon as the infant is admitted, and before it is sent to the country, it receives, at being baptized, a name different from that with which it was received. Henceforth, the mothers are permitted to inquire after their offspring every Monday, but they do not know the names they have in the institution, only their number being known. The children are

rarely returned to their relatives. The cases in which inmates of the institution, or former inmates, are made acquainted with their true names, are but few indeed.

Such is the institution, as it exists and is at present managed, in Guildford Street. It is meant to exclude the infants, not to receive and raise them. Noble Captain Thomas Coram would not recognize his own institution if he came to life again. The fact that after Parliament had in 1754, donated a yearly sum of ten thousand pounds and admitted every child offered, all at once, during four years, fifteen thousand little ones were delivered and ten thousand died—a fact which is easily explained by the incomplete arrangements for the sudden increase in numbers—has been the cause why British conscience prefers, up to this day, to let them die out of sight. As long as the grounds of the "Foundling Hospital" in Guildford Street look well kept, as long as the Sunday service in the large hall of the house is crowded by a self-complacent audience of the well-dressed better class and aristocracy of London, and the silver plates of the doorkeepers are filled to their utmost capacity with the contributions every visitor is expected and urged to give, it appears to be fully satisfied. The crowds of ladies and gentlemen thronging around tables at which a few hundred English children are taking their public Sunday dinner, appear to go there for the purpose of complimenting themselves and each other on the bountiful manner in which Old England takes care of her indigent and young. The numberless who are not admitted, or kept out by hard and inhumane rules, are not taken into consideration. Moreover, even those who are sustained in the institution do not fare very well. The philanthropic visitor who goes on Sunday to see the institution, attend the service, and watch the public feeding, like the proceedings in a zoölogical garden, involuntarily comes to the conclusion that the children are retained there for nothing but the show of philanthropy, for no other education but Sunday choir singing and—withering. The girls are never, until their final discharge, permitted to leave the walls and grounds of the institution; the boys, twice a year. Thus it is that, according to the careful

report of a special commissioner, Mr. Wrottesley, but very few attain a medium height.

The cruelty and hypocrisy of a legislation like this of London on the admission or raising of infants is best shown by their results. Mothers know that if they "drop" children they are harshly punished, without the chance of benefiting their offspring. Thus "child-dropping" of living children is but rare in London. The records of the Metropolitan Police District of London, which have been kindly placed at my service by the authorities, exhibit the following small numbers for the larger portion of the millions called London: In 1864, 23 living children were found abandoned; in 1865, 22; in 1866, 30; in 1867, 39; in 1868, 35; in 1869 (January-March), 9.

The explanation of these small numbers is exhibited by the following figures. Of dead (murdered) infants in the streets of the same district there were found 225 in 1864; 169 in 1865; 237 in 1866; 173 in 1867; 170 in 1868; 26 in 1869 (January-March). These figures do not prove a great success in encouraging morality amongst English society, which is the outspoken object of the laws in reference to the rearing of the poor young. Great Britain appears to have more infants than it means to be embarrassed by; and Guildford Street Foundling Hospital is the proof of its anxiety for the indigent young and its own respectability.

Fortunately a correct appreciation of the necessities of infancy and childhood is understood better in a large portion of Great Britain than in the metropolis. A large number of reports on the "boarding-out system" yields a convincing evidence of its appropriateness and success. We take a pleasure in crediting much, or most, of our knowledge of the realization of the boarding-out system, as far as Great Britain is concerned, to Florence Hill, "Children of the State: The Training of Juvenile Paupers," London, Macmillan & Co., 1868; and William Anderson, "Children Rescued from Pauperism; or, The Boarding-out System in Scotland," Edinburgh, John Menzies & Co., 1871.

In 1828—according to Florence Hill, page 118—was

originated in Dublin, by three Protestants of very humble position, an orphanage for the fatherless of their own faith. Until that period such bereaved little ones had frequently found a refuge in the numerous institutions established by benevolent Roman Catholics; but in these, not unnaturally, conversion to the creed of their benefactors became, if not absolutely a condition, generally a consequence of the children's admittance; and to provide for their education in the religion of their parents, the Protestant Orphan Society was founded. A *penny-a-week* subscription was set on foot by the suggestors of the scheme (in Ireland a common and, as it appears to us, a touching mode of raising funds for charitable purposes, including, as it does, the offerings of the lowliest), and with the humble sum of threepence they commenced in November, 1828, their operations. Difficulties, at first appearing almost insuperable, were by energy and perseverance surmounted; money flowed in apace, and the Archbishop of Dublin became the patron of the Society, while the Provost of Trinity College and the Dean of St. Patrick's accepted the office of vice-presidents. Twenty-four destitute orphans were selected as the first recipients of its bounty, and a plan was adopted for training its wards which has ever since been pursued. No vast and imposing building was erected, swallowing up the funds of the institution and accumulating the children in unwholesome numbers; but the orphans were sent into the country to board in the families of respectable Protestants, usually laborers or small farmers, the moral or religious character of the foster-mothers being duly ascertained.

The children were also taken under the voluntary supervision of the Protestant clergymen of the district in which they were located, with whom the committee of the Society constantly corresponded concerning their welfare, and through whom all payments to nurses were made; and to these three safeguards—the respectability of the foster-parents, the frequent visits of inspectors, and the constant friendly surveillance of a resident clergyman—were soon added yearly, and, if occasion required, still more frequent, visits by three members of the committee.

The sums paid by the Society to the nurses were originally £4 per annum for children under two years of age, and £3 10s. for all above that age. These were to cover the expense of food, lodging, washing, and education—the Society providing clothing. Subsequently these amounts were raised to £5 for children under one year of age, and £4 for all above; the Society paying 5s. per annum to a neighboring school for each child able to attend.

A considerable number of the subscribers had desired, when the association was formed, that a house should be taken as a dwelling for the orphans; and consequently, a very careful investigation was made into the relative merits of the two schemes. The inquiry resulted in the conviction *that the cost of the children maintained in a house apart would be three times that of their support in families;* while the moral advantage of replacing them as nearly as possible in the circumstances appointed by Nature—where, in the circle of an industrious family, they would be trained by example as well as precept in habits of activity and labor—was believed to afford an equally strong motive for adopting the boarding-out system.

There appears to be a growing feeling against orphanages at home and aboard. "Une grande question a été mise à l'ordre du jour d'une importante assemblée, qui doit se tenir dans le courant de cette année en Hollande, 'Le peu de succès qu' obtiennent les orphelinats,'" writes Monsieur John Bost in his last annual report of his marvellous institution at Laforce, in France, where orphans form one of the many classes of the bereaved and the afflicted whom he takes under his benevolent care and teaches to be mutually helpful.[2] He argues, however, that unless every orphan can find a home in a family, orphanages are "*une déplorable necessité*"; but he urges in eloquent and touching language the importance of rendering life in such institutions as little distinct as possible from that of the outer world, and shows how this is accomplished at Laforce.

2 "Les Oeuvres de Laforce," London, Nisbet & Co., 1867.

A burial place [3] for those of the orphans who may die in Dublin was granted, unsolicited, by the incumbent of St. Catherine's. The spot he gave is close to that where, having just laid the body of a friend in its last resting place, and deeply moved by the destitute condition of his children, three humble tradesmen devised the Protestant Orphan Society. A suitable inscription on the tombstone placed in memory of the orphans first buried there records the origin of the association. It has indeed become a mighty tree from so small a seed! The provincial branches, as we learn from the annual report issued in March, 1866, have increased to thirty. They have 2,208 orphans under their care, and have placed out in the world 5,376; 1,817 orphans have shared the bounty of the parent society, of whom 453 children are now under its charge; 831 have been apprenticed, and 428 have been returned to friends whose circumstances had sufficiently improved to authorize the restoration.

The mortality of the Dublin orphans, calculated in 1862 upon several preceding years, is, according to the eminent statistician, Dr. Neilson Hancock, slightly under 1 per cent. per annum, the average national rate for their age being about $1\frac{1}{2}$ per cent.[4] Let us contrast this with the deaths for the same period throughout Ireland in workhouses, which, for children under sixteen, was about three times the national rate, while in Cork Workhouse this was multiplied ten times; and in North Dublin Union the mortality of children under two years amounted to nearly 100 per cent. "In other words, children under two years of age were not likely to live more than ten months in the house." [5] No wonder the guardians of that Union urged the non-admission of such children, "as it would be nearly certain death to receive them." [6]

About nine years ago [7] a similar orphanage, called St. Brigid's, was established by a Roman Catholic lady in Dublin, with the warm approval of the Roman Catholic

[3] Florence Hill, p. 131.

[4] "The Mortality of Children in Workhouses in Ireland." By W. Neilson Hancock, Esq., LL.D. Dublin, 1862.

[5] Ibid. [6] Ibid. [7] 1859. Florence Hill, p. 135.

archbishop, for children of that faith. Placed to board in respectable country families, they are constantly visited by the conductors of the Orphanage and watched over by the priest of the parish in which they dwell, and at a suitable age they are apprenticed to trades or service. Within seven years of the commencement 500 children had been taken in charge, of whom only three or four had turned out ill, while 200 were "already working for themselves at trades, at service, or growing up in the families and as the sons and daughters of the foster-parents."

The systematic attempts at realizing the boarding-out system made in England are but few. The results, however, of those trials which have been made by Mrs. Archer, of Swindon (Florence Hill, p. 176), Mr. Armistead, of Cheshire (p. 184), Miss Boucherett, of Lincolnshire (p. 190), by the Guardians of Leominster Union, and by the Guardians of Eton Union (p. 206), are very encouraging indeed.

The very best and most impressive results, however, have been obtained in Scotland.

In 1864 the *Workhouse Visiting Journal* printed an abstract of answers to questions submitted by it to Mr. Greig, clerk to the Edinburgh Parochial Board, upon the system adopted by that body in respect to the orphan children under their care; and the document has been since reprinted in various publications. We are enabled,[8] by his courtesy, to give the following fuller information, brought down to the end of 1866:

"*Report by George Greig, Inspector of Poor for the City Parish of Edinburgh, as to the mode of dealing with Orphan Children in that Parish,* 1866.

"The pauper children of this parish were formerly maintained in an institution called the Orphan Hospital, apart from the poorhouse, but so dissatisfied was this Board with the results, that about eighteen years ago they resolved to board the children with families in the country, where they might have the physical advantage of the country air,

[8] Florence Hill, p. 159.

as well as the moral one of being separated from bad associates and brought into contact with people of good character. This plan has since been followed by all the larger parishes in Scotland, the number sent out at present by the parishes of Edinburgh and Leith being upward of 700, by Glasgow somewhat more, and by Dundee, Aberdeen, and other towns, in proportion to their population.

"With the view of securing proper supervision in carrying out the family system, this Board appointed an assistant to the inspector, whose sole duty it is to superintend the children boarded out, both boys and girls, and to find out good nurses for them.

"They are boarded with cottagers, farm servants, or tradespeople, and not with persons who make the care of them their only task.

"Preference is given to people of character who have a steady income apart from the allowance for the board of the children, and who will receive and treat them exactly as members of their own family; and it is found that when the children are sent out young, they learn to call the parties to whom they are sent father and mother.

"They acquire toward them the feelings of children, and the result generally is that the nurses acquire for them a parental affection.

"In selecting nurses for the children the assistant inspector visits the parties who agree to take them (and there are generally plenty of applicants), and makes inquiry in the neighborhood as to their character; inspects the house as to its accommodation, dryness, and ventilation; ascertains if there is a well-taught school in the neighborhood; and it is only after being satisfied on all these points that children are sent.

"He afterward visits the nurse as well as the school at least eight times in the year; satisfies himself that the children are healthy, sufficiently fed, cleanly kept, and their education attended to; and, in addition, the inspector and members of the Board, in rotation, visit all the children boarded out once a year.

"People of excellent moral character are generally got to take charge of the children; but, should inferior per-

sons be perchance selected, the close superintendence prevents them from doing injustice. Should neglect occur in any case, however, the children are at once removed; but although there are about 300 children boarded out, and some years ago there were 400, I have only had occasion to remove children, in consequence of neglect on the part of their nurses, on three or four occasions during a period of five years.

"The localities selected are generally small villages at a distance of ten, fifteen, or twenty miles from Edinburgh, and of convenient access by railway; and never more than four children are sent to one family.

"In consequence of our requiring the regular attendance of the children at school, the teacher has to fill up a schedule—showing their progress, and each day's absence with the reasons given—which forms a check on the nurse. Our children are, consequently, the most regular in their attendance; are generally the best scholars, carrying off a large share of the school prizes; and when sent to service prove as good servants as the children of the cottagers or workpeople not dependent on the rates usually do—certainly not inferior, and many of them rise to positions of trust. It is a rare thing for either a boy or a girl, who has been brought up by the Parochial Board in this way, to become chargeable to the parish in after-life, which was not the case as to the children who were brought up in the hospital in town.

"In a report by Mr. Adamson, the able inspector of Glasgow, issued in August, 1864, reference is made to results equally satisfactory in the case of the children who had been boarded out and brought up in the same way by this Board.[9]

"The Board pays to the nurse, for each child sent to board, two shillings and sixpence a week, which covers board, lodging, washing, and mending. The Board, in addition, provides clothing, which is sent from the poorhouse, of a good quality, and not uniform in color or kind;

[9] The boarding-out system has been pursued in Glasgow for upward of a hundred years.

and also pays the fees to the schoolmaster, the same as paid by the children of the district. In cases of sickness, which is rare, the nurse obtains the services of a medical man in the district, for which the Board pays. The total amount of all these charges for each child for the past year, including the salary of the assistant inspector and all expenses connected with the children, was £8 10s. 10d.

"It is the nurse's duty to take the children with her to the church which she attends, to see that they attend the Sabbath-school and study their lessons, and, in short, to deal with them in every way as if they were her own; and with the view of extending the benefits of the domestic influence on the children beyond the period when the Board has charge of them, we get the nurses to find apprenticeships for the boys and service for the girls, as much as possible, with employers in their own neighborhood, so that the children may have an opportunity of visiting their nurses on the Saturday afternoons, or at other times when they get liberty; and, in these cases, the nurse continues her care over them, and washes and mends their clothes when necessary, for which they remunerate her.

"On such visits the children are received with friendly welcome, as if it were their home, and they thus contract the habit of returning to it at intervals, assured of meeting with advice in difficulties, sympathy in distress, and heartfelt congratulations on success.

"In the event of a boy or girl having to leave their service, through sickness or otherwise, they return to their nurse's house, and are often supported there for months without any remuneration ever being asked from the Board. Should the nurse, however, not be in a position to do this, or wish assistance, the Board readily grants it, but this is seldom asked.

"Many cases have come to my knowledge where the child has in after-life contributed toward the support of the nurse.

"The children are sent to board at all ages, but *the younger they are sent so much the better.*

"*If sent when at the breast, the nurse cannot help having a strong affection for them.* In those cases where the children are ten or eleven years of age before they have come on the parish, and whose previous training has been vicious, the same good result cannot be looked for; still it is found that a religious education, kindness, and the moral influence of their new friends and associates do much for them.

"Cases have occurred where such have acted well so long as under these influences, but on return to town, and meeting old friends, have fallen back into their old habits; hence this class are sent to the most distant localities, and situations found for them, in the district if possible, so that they may not be again brought into contact with their old associates.

"The children thus brought up are not only well educated, but understand and can discharge the various duties of a household, which children brought up in a school or hospital know nothing of; hence our children are preferred, as servants and apprentices, to the children brought up in the various hospitals in this city at a cost of as much as £50 a year each.

"We are still compelled to have a number of children in the poorhouse, when their parents are in jail or in sickness, and therefore, the chargeability merely casual; and amongst them we daily see the evil effects of having a large number of such children congregated together; as not only do they encourage each other in present evil, but the fact of being inmates of such a place has a debasing influence on their after-life.

"The evils attending the rearing of children in workhouses are well described in an article in the *Journal of the Workhouse Visiting Society* for September, 1861. It states: 'The main objections to workhouse schools are, 1st, the keeping up a condition of pauperism in the children by the associations of the workhouse; 2d, the impossibility of teaching useful knowledge to fit the children for practical life, without the contamination of the adult. Communication with the adults, and the influence of the low tone of morality of pauperism, are inevitable. The

mere learning in school is insufficient to overcome it, and the teachers strive against it in vain.'

"The danger here adverted to, of keeping alive the spirit of pauperism, is one which this Board has had particularly in view, and against which it has felt too many precautions could not be taken. In a large adjoining parish in Edinburgh, the managers or guardians some years ago arranged a plan by which they personally visited the children, after they had been sent to service, and endeavored to exercise a care over them; but it was found that the personal intercourse thus maintained by these parochial gentlemen had the effect of keeping up in the children a feeling of their connection with the parish, and a depressing consciousness of dependence which was quite opposed to individual effort and consequently to success in life.

"In fact, the blight of pauperism extended over, and deprived of beneficial influence, all these friendly communications—often well meant and attended with no small trouble on the part of the gentlemen who engaged in it—and the plan had consequently to be relinquished. The cause of this want of success it is easy to discover. It was that these gentlemen, in a higher station, having no connection with the children except that they were members of the parish Board, instead of forming a link between the child and the kindly influences of home which the nurse can do, kept up a connection between the child and its former condition of pauperism, degrading it in its own eyes, and, when known to its fellows, subjecting it to their scorn.

"When a child is sent young to the country, or has been there for some time, and is taught to look on its nurse as its parent—I say parent, as we transact with the wife as the party having immediate charge, but the husband takes an equal interest in the child and is equally regarded by it—and when the nurses are themselves quite independent of the parish, the child regards itself as a member of the family; its connection with the parish is neither felt nor understood; and I have often found that the only idea it had was a vague one that the assistant inspector, who

called so frequently, had somehow some charge over it, but it had no idea that it was a pauper, and would treat with the same horror and contempt as is entertained by the respectable working people a proposal to remove it to the workhouse.

"This removal of the consciousness of a state of dependence on the parish, and the engendering of a spirt of self-reliance which is cherished by the class with whom the children are brought into contact, is a sure means of preventing them from lapsing into a state of hereditary pauperism; a result which can be obtained by no method that I am aware of but the family system adopted by this Board.

"In adopting this system, in restoring, as it were, the lost link, and giving these poor children new parents and homes, with their sacred influences and endearing ties and associations, this Board is persuaded that they are acting in accordance with a law ordained by Him who has framed the moral government of the world; and the results obtained in the moral elevation and excellent education of the children, in adapting them for the duties they will be called on to discharge, in the position of life they are likely to occupy, have been such as might have been expected from a plan thus solemnly sanctioned."

"Confirmation of this favorable report by Mr. Greig—so far as she has had opportunities of observing—is communicated to us by a lady who for many years has been led by her philanthropic labors among the working people of Edinburgh and the adjacent counties."

The favorable statements of Mr. Greig are fully corroborated by Mr. Anderson. According to him:

If the problem, how to deal with juvenile pauperism, is ever to be solved, an effort must be made to strike at the root of the evil in a way which has not yet been done. What is required is a system which will purify the stream at its fountain-head, instead of merely attempting to do so half-way on its course. The ragged and industrial schools have done, and are doing, a great work; but that work would be more effectually accomplished—if, indeed, it

would then be necessary at all—were a system adopted by which the children could be reserved till they reach the age at which they now enter the ragged and industrial schools, and before they are found guilty of crime. Powers ought certainly to be obtained for the protection of children who are growing up, not only in ignorance, but under a system of slavery, both of body and mind, which it is deplorable to contemplate. Many of them are groaning under an iron heel of despotism; crushed to the ground by those who have, but do not deserve, the name of parents; subjected to hunger, cold, disease, and privations of every kind; and consequently their moral faculties vitiated and their physical powers degenerated and depraved.

One great advantage of the boarding-out system is that the children are lifted above the atmosphere of pauperism, their ideas are gradually dissociated from those pauperizing tendencies which would otherwise cling to them, and in the school they are put on an equal footing with the children of the other classes in the village. It is a remarkable fact that, out of the entire number of children brought up in this way during the last thirty years, the percentage who have turned out bad is almost *nil*. If the boarding-out system has a weak point, it is this, that the parochial authorities have no power to refuse to give up a child if claimed by its father or mother, let them be ever so worthless—and that, too, when it is perfectly well known that the child is being drawn down again into the gulf from which it had been taken. It would surely be a desirable thing to allow the Board to have the power to refuse to give up children to fathers and mothers who are by habit and repute criminals or drunkards, and to devise means to compel such parents to contribute to the support of their offspring.

The number of children boarded out[10] is about 320, of whom 114 are orphans, 57 deserted by their parents, and 149 separated from their parents.

The "nurses" to whom they are entrusted are householders belonging to the class of respectable working peo-

[10] Anderson, p. 21.

ple. The period during which children may be boarded out is from their birth until they are thirteen years of age. In adverting to some of the principal features of the scheme, I would first draw attention to the healthy condition of the children as compared with the same class living in the wynds and closes of Edinburgh. At a low estimate the death rate of children under thirteen years of age living in the Old Town of Edinburgh is about 35 in 1,000 per annum, and in one district, according to Dr. Littlejohn's report, it is 152 in 1,000 under five years. Now, the death rate of the "city children" boarded in the country has, during the last three years, been only 3 in 1,000 per annum!—a very striking fact, which ought not to be lost sight of. In the course of my visits I found it almost invariably the case that children who had been resident in the country for a year or two were strong and healthy, but that when they were at first sent out they could take scarcely any food and were suffering much from the neglect as well as from the viciousness of their parents. The answer generally given by the "nurses" to my inquiries as to the health of the children was: "Ay, they were weak, puir things, when they cam' oot here, but they're as strong noo as ony o' the rest."

One thing which was impressed upon me more than almost anything else by my visits was the importance of rescuing the children at as early an age as possible.

The rules adopted by the Edinburgh City Parochial Board are of a very simple description; and it is perhaps to their simplicity that much of the success of the plan is due. In selecting good "nurses" the Board inquires very minutely into the character, habits, and circumstances of applicants. There are always a number of applicants who have no steady income of their own. This class of people is avoided, and the Board prefers those who are not dependent on the children's allowance. The former class, rather than answer some of the inquiries put to them, sometimes withdraw their applications. Certificates of character from respectable persons in the district must invariably be produced by the applicants. The questions put to them vary, but generally they are as follows: Name,

age, occupation, locality, and address. If married, name of husband, and income. If they have children, number and ages, distinguishing males and females. Religion, and what church they attend. Number of apartments in house, and its sanitary condition. Number of beds. If the applicants keep lodgers. Distance from school. If the teacher and school are well spoken of in the locality. If the girls are taught knitting and needlework. If there is a Sabbath-school in the district, and who superintends it. If the applicant is a widow she is asked if she has brought up a family of her own; if so, where they are, and what they are doing. If they give her any assistance. What is her present means of living, and if she gets relief from the parish. When the Board are satisfied that they have obtained a suitable applicant in a convenient locality, the inspector visits the house, sees whether it is dry and well ventilated, examines the state of the bedding and accommodation, arranges as to the separation of the sexes, and makes special inquiries in the district in regard to the applicant's character. The oldest boys and girls are sent to crofters, by whom they are employed on their little farms. All the children, before leaving the poorhouse to be boarded out, are examined by the medical officer, and certified as being in a fit state to be sent to the country. The average cost of 347 children boarded out during the year ending May 14, 1870, was as follows:

For board	£6 10 0
For education	0 10 9½
For clothing	1 11 7
For travelling expenses and superintendence	0 9 6½
For medical attendance	0 0 6¼
	£9 0 5¼

The parish of St. Cuthbert's commenced the system of boarding out children in 1843, and has had, for the last twenty years, an average of about 300 a year so boarded out.

The results, as corroborated by twenty-six teachers, to whom Mr. Anderson refers, are also, with high eulogies,

confirmed by a number of prominent gentlemen, the names of whom are given on p. 103. It is with pleasure, therefore, that our author refers to the favor the boarding-out system is *meeting with in England* lately. The objections which have been urged against the system by its opponents in England are completely answered by the success which has attended it in Scotland. In fact, the Poor Law Board of England have recently issued an order giving power to "Unions" to send children beyond their own bounds. As to this order, Mr. Anderson expresses his conviction that it would have been better without the restriction that no child under two years shall be boarded out. The Edinburgh Board have found that the sooner children are sent to the country the better. There are many cases in which children, when only a few days old, have been entrusted to foster-mothers—"a plan which has hitherto worked admirably."

"In conclusion," says Mr. Anderson, "I would express a hope that I have in some degree, at least, shown that one of the most promising questions connected with social reform in the present day is that relating to the boarding out of pauper children. It may be said to lie at the foundation of all real efforts for the diminution of pauperism and crime, in respect that it lays the axe to the root of these evils; and I accordingly hail with much satisfaction the gradual extension of the system in England. It has been practised in Scotland for many years in a quiet and unostentatious manner; and now that public attention is being drawn to it, we may look for still greater results than have hitherto been produced. In some districts reforms may with advantage be introduced; but the principle on which the plan is based is natural and true, and I have no doubt that any defects attaching to it will soon disappear. The boarding-out system takes under its control children who are, to all appearance, bound to grow up criminals if left to themselves, places them in decent families, provides them with education, obtains situations for them, and watches over their interests with a tender care until they are able to take their part in life and fulfil their duties as respectable members of society" (l. c., page 114).

In the same favorable manner Florence Hill expresses herself in the closing chapter of her book. She says, page 233: "The boarding-out system has been pursued long enough and under sufficiently varied circumstances to reveal its excellencies, and for us to estimate how far the defects disclosed are capable of removal or amendment. In Ireland, as a purely voluntary enterprise, it has attained marked success and won general approval; while in Scotland it has been widely adopted, and entirely administered by the parochial authorities. Of their satisfaction with it, under both a moral and pecuniary aspect, we are informed; and we have seen that it has obtained also the qualified approbation of disinterested but peculiarly competent observers, who are of opinion that an admixture of voluntary agency, including some additional supervision by ladies, would render it still more efficient.

"We could not conscientiously advocate the boarding-out system unless it be accompanied with constant and active supervision. This, the authorities assure us, is amply exercised by officials in those districts where the plan has originated with Boards of Guardians. But, zealous and kind-hearted as the officers appointed to this important duty may be, it must be performed by them to a greater or less degree as a matter of routine; the time of their visits of inspection may generally be calculated, and these cannot be sufficiently frequent to prevent, at any rate, the *possibility* of ill-usage. Moreover, a man, however thoughtful for the children's welfare, does not possess the knowledge of their wants and difficulties which comes to a woman almost intuitively; and to *supplement,* therefore, official authority by the *friendly* watchfulness which a woman of superior social position, residing *within easy reach* of the orphan's home, can exercise, appears to us the keystone of the system, insuring to it public confidence and permanent success.

"An objection to the boarding-out system to which we have already referred—namely, the insufficiency of good country homes—is, we ourselves believe from inquiry and observation, ill-grounded; and the experience of those benevolent persons who have introduced the plan in various

parts of England strengthens that conviction. All who are intimately acquainted with our humbler brethren (whose generosity in giving far exceeds that of the wealthy classes) are aware it is no unusual circumstance for a child who loses its parents to be spontaneously received into another family. Again, it must be remembered that where Mrs. Archer's scheme [11] is adopted, the very presence of the orphan will tend to improve the cottage in which it is placed, by laying it open to the inspection of a person whose good opinion the cottager will be anxious to preserve; while the orphan will in some respects enjoy even an advantage over the offspring of the cottager, namely, in its regular attendance at school, and still more in the fact that it is an object of interest to a neighbor of superior position who is responsible for its welfare, and able to remove it if the circumstances of its home are unfavorable."

As we intend to draw our own conclusions toward the end of this report, we take the liberty of here inserting the closing page of the meritorious book from which we have been so largely quoting (Florence Hill, page 273):

"The 'family system,' in any form, is, we are aware, at present unrecognized by the regulations of our poor-law,[12] and may be unknown even by name at the Central Board. Most respectfully, but most earnestly, do we ask for it their consideration. To it is attributed by M. Demetz a large measure of that success in reclaiming the young which has made his noble institution an exemplar to the whole world. Shall we be satisfied to achieve less for pauper children in England than is accomplished for criminal children in France? Mettray has converted to useful citizens 94.47 per cent. of the youths she has restored to liberty. Let us strive to show no less fair a return for all we expend in money, time, and care on our *children of the State!*

"We conclude with a summary of the principles proved, we submit, in the foregoing pages.

11 Enforcing superintendence and schooling.

12 Has been recognized since, as stated above in our extracts from Mr. William Anderson's book.

"1st. Our poor-law implies a right to aid from the State in all incapable of supporting themselves.

"2d. The State, in granting such aid, obtains a correlative control over the recipients.

"3d. The vast power she thus takes to herself furnishes her with means for the reduction of pauperism which her own interests, apart from higher motives, render it imperative on her to employ.

"4th. These means lie, as regards the young, in so training them as to impart the desire and the capacity for self-support.

"5th. One condition essential to this end is their complete separation from adults of their own class—such separation being impossible where the school forms part of the same building with the work house.

"6th. That must be the best method of training children which is appointed by Nature—namely, under family influences; and when artificial methods are employed, they should be made to approach the model as closely as possible.

"7th. The method practised in our pauper schools is contrary to that established by Nature, and fails signally in producing good results.

"8th. The 'family system,' as pursued in industrial homes, and as still more precisely followed in 'boarding out,' while it secures separation from adult paupers, conforms, as nearly as practical obstacles permit, to the course prescribed by Nature herself.

"9th. Its success has been proved by long and varied experience."

The general rules for the care of abandoned children in France are, in their majority, those laid down in the decree of the Emperor Napoleon of January 19th, 1811. This important law is as follows:

1. The class of children whose education is obligatory for public charity comprises foundlings, abandoned children, and orphans.

2. Foundlings are those whose parents are not known,

and who are picked up at any place, and are carried to such institutions as are provided for their reception.

3. These institutions must be provided with a turning box for their reception.

4. Every district ("arrondissement") is to contain at least one institution of that kind. The apparent age of the newcomers, peculiar marks, and cloths must be recorded.

5. Abandoned children are those whose parents are known, or who have been supported by strangers and finally abandoned.

6. Orphans are such as have neither father nor mother, and no support whatsoever.

7. New-born foundlings are to have a country wet-nurse at once; until this can be done, they are to be fed on the bottle or nursed by a wet-nurse in the institution.

8. The infants receive the necessary clothing and remain with the nurse until the termination of the sixth year.

9. After the sixth year they are apprenticed with agriculturists or mechanics. The price of boarding will be reduced with every successive year until the twelfth, when they will be at the disposal of the Minister of Naval Affairs.

10. Sickly and crippled children, who cannot be boarded out, will be retained in the institution and employed at work for which their age enables them.

11. The hospitals destined for the reception of foundlings are to find the expense of their clothes, food, and education, and of the general administration.

12. Four millions of francs yearly are set aside for that purpose. Any deficit will be covered by the general hospital and municipal funds.

13. Wages cannot be paid except on the presentation of a certificate, as to the life of the nursling, of the mayor of the community the infant is boarding in.

14. Twice a year an inspection is to be held by a special commission, a physician, or the vaccinating surgeon.

15. Foundlings and abandoned children are subject to the supervision of the administration of the foundling hospitals.

16. The children, being received and educated at the expense of the commonwealth, are at the disposal of the Empire. After the Minister of Naval Affairs has taken charge of them, the authority of the administration of the foundling hospitals terminates.

17. After their twelfth year, unless the Empire has disposed of them, they are to be apprenticed somewhere—the boys with mechanics or artists, the girls with housekeepers, seamstresses, in shop or factories.

18. The apprentice agreements require money neither for master nor apprentice. The master has a claim on gratuitous service until the twenty-fifth year of the apprentice; the apprentice on board, lodging, clothes.

19. The agreement becomes null and void in consequence of conscription into military service.

20. Such children as cannot be apprenticed because of their state of health, nor find any place outside, are retained inside the institution. For them separate shops are required.

21. The children cannot be reclaimed by their parents and returned to them, unless, if able, they refund all the expenses incurred for the foundling. Such obligations as the Government has agreed to previously cannot be annulled by the fact of reclamation.

22, 23. Persons who habitually abandon children, and carry them to the foundling hospitals, are subject to legal punishment.

Still the special rules of admission of the foundlings of Paris (or France) have been greatly changed from what they were at the time of the indiscriminate receiving by means of the wheel ("tour"). A great many questions are asked concerning the abandoned infant, its parents, and the person presenting it, by a commissary of police.

1. Concerning the abandoned child: Name and surname, place and date of birth, police bureau where it has been inscribed. Has it been baptized? At what church? Legitimate or illegitimate? If the latter, is it acknowledged by father and mother? If it is unknown, describe clothes and particular marks; particular circumstances connected with the abandonment.

2. Concerning the parents: Name, age, occupation, place of birth, and present residence of the mother. Is she married and living with her husband? The latter's name, age, occupation, place of birth, and present residence. If she is not married, does she give the name of the father? If she does, what are his name, age, residence, occupation, earnings or property? Is she abandoned or supported by him? Does she live with him? Precise time, reason, circumstances, and purpose of the mother's arrival at Paris. Where has she resided and what has she been engaged in for at least the last year? Papers, letters, certificates to sustain her declaration. Has she her own furniture or not? Amount of the rent she pays. What does she live on and what does she earn? Has she parents living? Their names, occupation, and residence. Are they able and willing to support her? Has she children besides the one she means to abandon? What has become of them? Is this the first she abandons? Has she been advised not to abandon her infant, and has she been given to understand that she may receive support for the purpose of raising her child? Has she will hear of it but once in three months? Has she port? What answer has she given? Has she been told that she will never know where her child will be, and that she will hear of it but once in three months? Has she been told of the legal punishment of false declarations?

3. Concerning the person presenting the child: Name and surname, occupation and residence, circumstances inducing him (her) to present the child at the institution.

Unmarried mothers who express their willingness to nurse their own infants have a claim upon aid from the public funds. Thus many nurslings have been retained by them. This proceeding is by no means a new one, inasmuch as early as in the eighth century Archbishop Darthæus established the above rule in the newly-established foundling hospital at Milan. The National Convention passed, on July 28th, 1793, a law to the effect that every mother who promises to care for her own infant has a right to be aided by the community. This law was suspended by an act of December 17th, 1797, constituting general foundling establishments, and by the law of January 19th, 1811,

directing the institution of foundling hospitals with turning boxes ("tours") and concealment of maternity. Still, the rule was again subverted in favor of the mothers willing to nurse their babies, and in consequence of the public institutions becoming crowded. The plan has acted successfully. In 1848 fifty-two out of the eighty-six departments of France awarded the gratifications to mothers; thirty-four refused it. In these fifty-two, with a population of 18,866,030, and with 44,976 mothers aided in the above manner, there was 1 foundling to 420 inhabitants, and 1 abandonment to 49 births. In the thirty-four, with a population of 15,328,845, and no aid to the mothers, there was 1 foundling to 296 inhabitants, and 1 abandonment to 32 births. The aid granted is by no means of the same nature in all the cases. Some mothers are supported until they can resume their occupation. Some are aided with money for two years, the amount being half of the legal boarding money of the foundlings. Some are supplied with wet-nurses, on the promise of refunding the expense in instalments. A great many mothers who cannot keep their infants with them, and still do not wish to give them up entirely, avail themselves of this facility.

Duties of nurses and keepers to the infants and the administration:—The nurse is obliged, if she takes charge of the infant before weaning, to wet-nurse it; to provide a separate bed; not to wean it before being authorized to do so by the proper medical officer; to have it vaccinated, if vaccination has not been performed before, within three months, but not within the first three weeks after receiving the infant; to notify the medical officer in case she falls sick or gets pregnant; and, in case the infant is taken from her within the first month, for any reason whatsoever, to be responsible for the corresponding amount of her wages, she having been prepaid for the month when the infant left the hospital for the country.

Duties of nurses and keepers from weaning to the fourteenth year:—To provide a separate bed; to send to common school after the sixth year; to provide instruction in the first principles of religion; to send to church on Sun-

days and holidays; to notify the authorities within twenty-four hours if eloped.

Duties of the same at every age:—Treat him (her) with mildness; notify the physician of any sickness within twenty-four hours; on no condition leave him in charge of another person without permission; take charge of no other child without permission; look for all the necessities of the child, and for its clothes, etc.; the clothes and linen given by the institution must be reserved for his own use exclusively; if the child is remanded by the institution, deliver him and his property at the local office; notify the proper officer three months in advance of any intention of returning the child; notify of death within twenty-four hours, and return neck band and property within a week; present child and property any time any of the authorities may require it; in case the child's parents turn up, never correspond with them, and inform the authorities; teach him a trade or agriculture; never send him away without due notice to the authorities; inform them of bad conduct; in case of elopement attend to the necessary steps and inform the authorities.

Duties of the administration toward the nurse and keepers:—Regular payment, at their place of residence, and within two months after the quarter has elapsed, of wages, gratifications, and indemnities; delivery of the necessary clothes in conformity with the law; gratuitous medical treatment and medicine for the child in case of sickness; payment of an indemnity for the years in which schooling is obligatory.

Extra remunerations are paid with every new lot of clothes delivered by the administration, for keeping the child regularly at school, for regular religious instruction, for keeping him to his twelfth year, for teaching him afterward a trade or agriculture.

The recognition of the infants sent to the country is rendered possible by their wearing a neck band of a certain description. It must be worn to the sixth year, when it is cut off and returned to the institution. Sickness may necessitate its removal, but under the supervision of the medical or other authority only. In case of death it has

to remain until official inspection has taken place. No payment is made when the neck band is removed without authority. After the sixth year the descriptive list of the child is deemed sufficient for its recognition.

Reclamations are not very frequent. In all France it takes place once in 100 cases. But one out of ten reclaimed children is legitimate. The majority of these are boys. The number of reclamations amounted to 3,322 in 1851, 3,737 in 1852, 4,390 in 1853.

The institution "Dei Trovatelli all' Annunziata," at Naples, was founded in the thirteenth century.

It is connected with an educational establishment, and costs annually 400,000 lire. The average number of foundlings admitted yearly, by means of the wheel turning box, amounts to 1,900. The contrivances by which the mothers or other depositors enable themselves to recognize the infants at some future period are simple enough, and very much like those resorted to in London in those times when the old method of receiving foundlings was not yet abolished; the modes of future recognition consist of broken coins, verses written on paper, etc. Every foundling is given a number, which is fastened to his neck by a band. At Rome he has the sign of the cross indelibly marked on his leg. The infant gets baptized within twenty-four hours. Two are given in charge of one wet-nurse, who has the privilege of nursing but one after the third month. Before 1862, when the institution was controlled by the clergy, more regard was paid to baptizing than to feeding; three or four infants being in charge of a single nurse. Sick infants get transferred to separate wards. A pretty large number of healthy infants is retained in the institution besides; in 1865 there were from 220 to 230. They get nursed fifteen or eighteen months, and are entrusted to nuns in an adjoining building for future care. There are many women in Naples who are very desirous of receiving foundlings for wet-nursing gratuitously, although they are limited to this one nursing, and, moreover, controlled and superintended by the institution. Undoubtedly they mean to prevent pregnancy by protracted nursing. Thirty-

seven per cent. of the nurslings are cared for in this manner, 19 per cent. are paid for (in the first year about one dollar and a half, in gold, per month), and 140 per cent. are taken charge of by the parents. Only about 12 per cent. are returned to the institution; the rest are retained by those having them in charge. Boys in particular are retained, as they can be made available after their seventh year. Such children as remain in, or are returned to the institution are transferred, when seven years old, into the orphan asylum (gran stabilimento dei poveri). There they are schooled and taught a trade. The girls have a right to remain through lifetime; they may leave, however, when of age, resigning their claims upon the institution. After their seventh year they learn the elements and handiwork, work in common in large rooms, especially on sewing—two-thirds of their earnings belong to the institution. But few of these girls get married. In the foundling institution of Florence every healthy infant is farmed out. Every nursling pays ten francs a month; those who raise a boy to his eighteenth, or a girl to her twenty-fifth year, are remunerated with an extra gratification of 58 francs. The girls are given 235 francs when they get married; there were, from 1855 to 1865, 1,403 who obtained this sum. In the same period 22,864 infants were transferred to the institution. Mortality was as follows:

	Males Per Cent.	Females Per Cent.
In the first year of life	31.63	28.63
In the second year of life	17.63	18.79
In the third year of life	1.08	0.91

There were in the kingdom of Italy (1867) 83 foundling institutions, besides a number of small institutions in small towns—viz., rooms in which a wet-nurse is waiting for and on the newcomers, who are transferred at once into the charge of proper officials. Where funds are insufficient for the purpose the town is responsible. The average number of foundlings left in charge of the institutions, from 1863 to 1866, amounted to 33,222—viz., 3.85 per cent. of the whole number of births. Of illegitimate births

there were but 1.23 per cent. besides. Thus the number of illegitimate births is greatly less than in Germany or France. Nor ought it to be overlooked that part of these 33,222 foundlings are legitimate children.

At Rome the foundling institution is connected with the large institution for the sick and poor, "Lauto Spiritu." The mode of admission is as easy as at Naples.

Very few babies are retained in the institution, usually but 65 or 70, and these are sick ones. When farmed out the infant under a year pays one scudo (one dollar); from the second to the tenth year three-quarters of a scudo. With people who mean to retain the children beyond that time special agreements are made. Girls who do not find proper employment are at liberty to return. From 1830 to 1840 the average number of foundlings was 834; from 1860 to 1865 it amounted to 1,116. A large portion of those given in charge of the institution are born in wedlock. Dr. Erhard, a practitioner at Rome, told me that the delivery of their offspring to the foundling institution by their parents was quite common. As a rule the mother, or more frequently the father, would carry the baby toward the capital from any part of the territory in a basket on top of the head. In certain way-stations a woman is appointed to nurse the baby, and every official and most women of the neighborhood are able and willing to direct the carrier and his living freight.

The annual reports of the foundling institutions of St. Petersburg for 1857 and 1865 yield some very interesting facts. The foundling institutions consist of the following establishments:

1. The department of the nursery, with offices, residences of officers and attendants, etc.

2. Twelve country districts to which the children are sent.

3. A hospital in city for the crippled and incurable.

4. A country place, being the summer residence of legitimate children. Infants are admitted any hour, by day or night, with the exception of such as suffer from small-pox or have passed the first year. Of children older than a year,

only such are admitted as are found in the streets or presented by the police. The inspector in waiting takes the necessary notes concerning the age of the infant and religion, but on nothing else. Within six weeks it may be reclaimed, but after this time it belongs to the institution. The number of the foundlings in 1864 amounted to 6,181, the legitimate children 422. Of the children—3,276 males, 3,327 females—1,329 died, viz., 21.1 per cent. Of those 5,971 entering the institution within the year the mortality was 22.1 per cent. A large majority of the infants admitted were in their first week; 55 were admitted in a moribund condition.

The foundling hospital of Moscow admitted from 1862-1864 35,387 infants—male, 17,446; female, 17,941. In the same time the number of deaths amounted to 10,008—male, 5,278; female, 4,730. Many were moribund when admitted; thus 521 died in the very first hour. The average mortality was, in 1862, 30.78; 1863, 27.38; 1864, 26.60—total average, 28.28 per cent. The largest number which can be accommodated in the institution is, or ought to be, 650. The smallest number ever present in these three years was 768, the largest 1,386. The wet-nurses are selected from those offering their services. Of 57,206 applications 34,209 were found available. Thus there were 1,088 wet-nurses less than infants. This disproportion, though by no means anything like what we are in the habit of seeing in our country, is the result of the system through which they are obtained. The 20,000 women confined in the Vienna and Prague lying-in hospitals are admitted on the promise of serving four months in the foundling hospital when required. Thus there is always a sufficient number of nurses in readiness for the new-born and foundlings until they are transferred to private parties in the country.

The rules and regulations, mostly old, to a smaller portion proposed in the course of last summer, of the foundling institute of Lower Austria (at Vienna) are the following:

The object of the foundling hospital is to procure to those illegitimate children who are admitted an equivalent of maternal care, without regard to religious persuasion, and to preserve the reputation of the mothers as much as possible. As far as the interest of the institution will permit, it has to supply the medical profession with vaccine virus, to instruct young physicians in vaccinating, and to supply the public with reliable wet-nurses.

Requirements for admission are the declaration of the community to which the infant or mother belongs, of the religion, and the proof of the infant being illegitimate in case permanent admission is wanted. Admission is either permanent or temporary, gratuitous or not. Admission is free for those infants who have been born in the lying-in asylums, but had to be transferred to a hospital because of sickness; exceptionally also for those whose mothers intended to ask for admission in the said lying-in asylums, but were confined before they expected to be so. In very rare cases illegitimate children are received of those mothers who have been confined outside the clinical lying-in asylums. The other parts of the empire are liable to refund the expenses for those children whose mothers do not belong to Lower Austria, or to take charge of the infants if or when they are fit to be transported.

Admission, non-gratuitous, is granted to all illegitimate children born outside the asylums, or in the paying departments of the same. Temporary non-gratuitous admission is granted when the mothers were received in the lying-in asylum after their confinement. Payment is required from the relatives or township of the mothers, or when the mothers of legitimate or illegitimate children have fallen sick or died.

Maternity is kept secret, the name of the mother being known to the authorities only, with the exception of those cases in which the other provinces are liable to pay the expense incurred by the admission and rearing of the infant, or where the child has to be transferred to its own province after the normal term of ten years; or where the child wants information concerning its family after the eighteenth year of life, or in case of courts of justice in-

quiring for information. On no other condition, except on presenting the certificate of admission in the hands of the mother, is any information given. The institution takes charge of the child until the tenth year. The individual villages and towns are responsible after this period.

The children are kept and raised either inside the institution or outside. Inside the institution the infant is to have a wet-nurse. Therefore, every woman obtaining free admission to the lying-in asylum is bound to serve as wet-nurse during a period of four months or less if her child dies. During that time, as a rule, the nurse has her own child; in case of particular fitness she will have to nurse two infants, never more. The women, moreover, are obliged to work on the premises.

Children with contagious eruptions are transferred to a hospital. Such nurses as take particular pains with an additional child besides their own have a claim upon an extra gratification. Outside the premises of the institution care ought to be taken that, if possible, mother and child be not separated. For this reason the child is to be trusted either to its own mother, or to such relatives or friends as are designated by her, or to strangers selected by her. Under equal circumstances, breast milk is preferred to artificial feeding; in case the former is declared an absolute necessity by the physician, or if the party live in Vienna, or at some other place equally unfavorable, parties with breast milk only are accepted. When the mother has no recommendation to make concerning the future abode of her child, it is selected by the physician or director of the institution. Strangers expecting to take charge of an infant have to present certificates of their general character, their circumstances, etc.; mothers retaining their children have to prove their domicile and give information of any moving. Such parties as are known to be particularly trustworthy and attentive may be permitted to take charge of several children; but these must be of different ages and sexes, to prevent mistakes as to identity. The determination of the time when the infant is to leave the institution depends on the physician or director. Board is fifty-four Austrian florins per year. Besides, there is a

quarterly premium of three florins for the first two years. Superintendence of the infant is entrusted to the mother and relatives in Vienna, and in the other large cities to an authorized physician; in the country, to the authorities and benevolent associations.

The foundling is removed from under the care of a party when the said party, promising to raise an infant on the breast, resorts to artificial feeding; when the parties are known to treat and feed the child badly, or when they live in injurious places; and further, when the children are found in the charge of other persons than those to whom they have been given in charge. In this latter case the courts of justice may inquire into the reasons for such transfer. Every mother has a claim upon her child any time she means to do without the help of the institution; as long as the child is in the charge of the institution the proper authorities are its legal patrons. Wet-nurses cannot be permitted to accept a private place unless they have served two months in the institution. A wet-nurse can be exchanged but once, and within a week only.

Admissions into the foundling hospital, Vienna:

1860,	8,842	6,278	died before the end of	tenth year
1861,	9,654	8,135	" "	"
1862,	8,935	7,375	" "	"
1863,	9,408	7,615	" "	"
1864,	9,795	7,870	" "	"
1865,	9,434	7,187	" "	"
1866,	9,294	8,087	" "	"
1867,	8,399	6,309	" "	"
1868,	8,148	6,815	" "	"

The percentage of deaths is by no means a small one, and can be estimated only for the several years. The death rates for the several years are not given. If we compare the results of general statistics, according to these the mortality of the Vienna foundling hospital in the first year cannot be less than forty-five per cent. of those admitted. It is to be hoped that this mortality will be greatly reduced by a stricter adherence to the plan of supplying

the farmed-out children with breast milk than was done formerly. Since the extensive and thorough discussion of the subject in the Vienna Medical Society, more than a year ago, a favorable change will probably have taken place, the more so as the Government has given its particular attention to the cause of the foundlings. The above rules and regulations are in part the result of the efforts and changes of last year.

The vast majority of the foundlings in Prague are those who have been born in the lying-in asylum. The foundling hospital receives the infants nine days after their birth, and from there they are distributed over the country. Under ordinary circumstances they are to remain in the province of Bohemia, so that the necessary superintendence by the authorities and physicians is not rendered too difficult. The attempts at raising the infants in the institutions have been given up. In the city of Prague the infants are to remain only when no party can be found in the country. Relatives of the infant, when willing to take charge of the same, are preferred; but they are not paid. Nor is its mother to retain the infant. A woman from the country offering her services to one of the new-born foundlings must be within seven months after her own confinement, and less than forty years old. She may have another foundling in case her own child dies. A woman who loses two infants in one year is not trusted any more. A woman may have charge, besides the infant, of one or two other foundlings; she must present certificates as to her reputation and circumstances; she is examined as to her physical fitness; she is paid monthly, and receives an extra gratification when the baby is eight months old. No baby is given out before it is nine days old. In winter they are not sent to any great distance; feeble infants remain in the institution.

With their sixth year they must be sent to school. Schooling is free. At ten years of age the obligations of the foundling institution cease, and the village or town of the mother is the custodian of the child. The parties with whom the child has been hitherto may retain it until its

twentieth year without charge, but after that age the foundling has the disposal of his own person and work.

The own mother may reclaim the foundling in case she can prove her ability to support him. The parties in charge can be permitted to adopt him; so can strangers who prove their good standing and circumstances, and on the condition either of the mother's consent or the child being ten years old.

Among the rules for bringing up illegitimate children in Munich are the following:

Police superintendence takes place in the case of all those who are entrusted to strangers, while the law permits of no such control when the child remains in charge of the mother or other relatives.

It is a misdemeanor, which is punished, to take charge of strange children under eight years without the approval of the police authorities, or after such permission has been retracted. Permission is refused unless the character, circumstances, and locality of the petitioner are satisfactory. Most of the infants who are given in charge are not nourished by breast milk; therefore, certain dietetic rules are enforced. Cellar and attic lodgings are excluded. The infant boarder is to have a bed and a bedstead of its own. No woman obtains permission when her own children are neglected, cachetic, or afflicted with contagious or exanthematous affections, or when she is sick or weakly. More than one child (two up to the age of a year), never more than four, are allowed where circumstances appear very favorable. Persons who have lost several boarders are suspected and generally deprived of their license. Some may, when their boarders died when very young, retain the license for a boarder of two or three years. No child is given in charge of strangers without having been examined by a medical man. Thus many a lurking disease, as rachitis, hernia, etc., is early detected. In case of sickness medical attendance must be resorted to immediately.

According to Farr, of 392,224 children born in England in 1867, there died before the end of their first year 65,-

464—viz., 16.69 per cent. According to the scrupulously conscientious Prof. Ritter, of Prague, the mortality during the first year of legitimate and illegitimate children born alive in 1855-61 was 25.36 per cent. in the Austrian Empire; in Hungary alone, in 1862-65, 24.95 per cent. In Berlin, according to Chamisso, the mortality of all the infants born alive from 1816 to 1841 was 22.7 per cent. up to the end of the first year, 33.5 of the third, 36.9 of the fifth. The rate was lower in 1842-60, but in 1861-66 it was 28.4 per cent. up to the end of the first year. In the following years it did not increase, and was even less in the fourth and fifth.

According to the Thirty-first Annual Report of the Registrar-General of Births, Deaths, and Marriages in England, abstracts of 1868, London, 1870, the death rate amongst 100 infants born alive in England was in 1868:

	M.	F.	TOTAL
Within the first twelve months	16.8	14.7	15.5
At 1-2 years	5.2	5.1	5.19
From 0-5 years	27.5	24.7	25.6

The percentages of deaths within the first year of life, in proportion to the number of total deaths, have been, according to Wappæus, in

Ireland	1845-1854	38.80
Bavaria	1835-1850	36.31
Saxony	1834-1849	36.20
Austria	1849.	27.39
Russia	1816, 1825, 1834, 1849	26.31
Sardinia	1828-1837	26.22
Tuscany	1852-54	25.71
Netherlands	1848-53	23.90
England	1850-54	23.49
England	1834-44	22.06
Sweden	1841-50	23.14
Denmark	1845-54	21.55
Holstein	1845-54	19.60
Norway	1846-55	19.05

Belgium	1841-50	18.77
France	1853.	17.70
Hanover	1853-55	17.61
Sleswig	1845-54	16.90

In all the above countries there were in the periods mentioned altogether 15,204,185 deaths. Of these there were 3,887,094 deaths of children born alive who did not reach the end of their first year. Thus the proportion of the infant mortality under a year to the total mortality is 25.57 to 100. Besides, there are 4.75 per cent. of still-born; thus a total mortality, still-born included, under a year, of 30.32 per cent.

In the above countries and periods 20,646,144 children were born alive. Thus of all the children born alive 18.83 per cent. did not reach the end of their first year.

The mortality of the second up to the fifth year is much less. The death rate (in proportion to the total deaths) is 15.03 per cent. Thus of all the deaths in the above countries and periods the rate up to the fifth years amounts (including still-born) to 45 per cent.

A comparative table, taken from Oesterlen, exhibits the following figures relating to the mortality of the first five years:

Of 100 children born alive, died, in

	0-1 yr., still-born, incl.	1-5 yr.	0-5yr.
Bavaria, 1835-51	32.81	7.71	40.52
Sardinia	22.68	13.86	36.54
Prussia	22.07	11.86	33.93
Netherlands	23.10	10.44	33.54
Belgium	19.44	12.30	31.74
France, 1853-54	20.13	11.35	31.48
England	19.29	10.94	30.23
Holstein	17.91	9.36	27.27
Denmark	18.60	7.85	26.45
Sweden	18.43	7.60	26.03
Norway	14.91	7.08	21.99
Average	20.85	10.03	30.88

In our own city of New York the rate of mortality is as follows. Of all the deaths taking place there were

	Under 1 year.	1-2	2-3	3-4	4-5	T'l un'r. 5 yrs
1866	28.97 per cent.	10.15	4.07	2.32	1.65	47.17
1867	32.23	12.06	4.56	2.03	1.61	52.99
1868	32.77	11.60	4.22	2.41	1.49	52.50
1869	29.42	11.55	5.14	2.91	2.07	51.09

Thus we have an average of 30.85 deaths of infants under a year amongst all the deaths taking place in New York City, exactly the same percentage laid down in the above large lists collected by Wappæus. As the number of our births is not sufficiently established to justify any comparative statistics to be based upon it, we may safely assume the death rate of 18.8 within the first twelvemonth, amongst 100 born alive, to be correct for the city of New York. If we shall compare this average death rate with the results of our public institutions, as found below, we are safe in saying that we build a great many costly palaces and spend enormous fortunes every year to no other purpose but to fill our graveyards with our infants and depopulate the city.

The death rate of that class of children from which the abandoned inmates of public institutions or those turned over to the care of society are recruited, is naturally much higher than the average mortality. Many of them are illegitimate, had poor care before they were abandoned, lived in crowded tenements or large cities, etc.

Common sense, experience, and statistics prove that the chances for life are less favorable for illegitimate and poor infants than for such as are born in wedlock and better circumstances. Even before birth the former are exposed to more dangers than the latter. The still-births in the former class are much more numerous. The statistical records of every country are unanimous in confirming that truth. The normal development from conception until birth depends on the health of the parents, in particular of the mother. Therefore, the viability of infants born in

wedlock and of healthy and careful mothers is greater than of those born in the inverse conditions. Poverty, ignorance, injurious mode of living, sickness, immorality, misfortunes, fear of detection, are just so many causes of death to the child, both before and soon after birth.

The following tables may illustrate the subject. There was amongst the births, 1850-1854, a percentage of illegitimate births, in the district of

Liegnitz, Germany	12.1
Cologne, Germany	5.1
Aix-la-Chapelle, Germany	2.8
Trier, Germany	3.8

	Percentage of still-births.		Mortality under a year of those born alive.	
	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.
Liegnitz	5.4	7.2	25.4	36.2
Cologne	5.1	7.2	14.6	23.1
Aix-la-Chapelle	4.0	5.9	15.9	23.4
Trier	4.0	6.3	13.9	23.0

Of 100 births there were still-births in Berlin:

	1865.			1866.			1867.			1870.		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.
Leg.	4.47	3.52	4.09	4.05	3.56	3.87	3.80	3.40	3.60	4.52	3.75	4.16
Illeg.	7.93	7.11	7.53	7.85	7.34	7.60	8.09	7.27	7.69	7.94	6.06	7.23

In Breslau:

	1865.			1866.			1867.		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.
Legitimate	3.47	2.92	3.22	3.96	3.12	3.55	3.75	2.61	3.21
Illegitimate	4.41	2.43	3.47	4.09	3.27	3.67	4.18	5.56	4.88

In Vienna:

	1869.		
	M.	F.	Total.
Legitimate	4.60	3.82	4.23
Illegitimate	4.81	4.32	4.65

Besides, the greater mortality amongst illegitimate children born alive is an established fact. The same causes act both upon the fœtus and the born children.

There died in	Of 100 legitimate.	Of 100 illegitimate.
France.....1840-57	13.9	30.3
Prussia.....1820-34	17.1	23.6
" 1816,25,34,43,49	16.5	30.2
Berlin 1820-34	19.8	36.8
" 1843	19.3	33.9
Sweden ...1841-50	14.4	24.8
Stockholm..1841-50	22.2	42.2
Bavaria.....1835-51, male	33.4	38.3
" .....1835-51, female	27.9	33.8
Austria.....1851	22.9	35.1
Saxony.....1847-49	23.0	28.9
Average.....	21.8	32.5

A very careful table is the following, prepared by Prof. Ritter, of Prague.

Deaths at Prague, 1868, of 100 born alive:

	Legitimate.			Illegitimate.			Total.		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.
1 month.....	7.51	6.98	7.28	4.70	20.22	21.00	14.66	13.47	14.07
2 months.....	2.83	2.94	2.88	2.04	2.25	2.15	2.43	2.54	2.48
1 year.....	26.05	21.19	23.67	28.12	26.86	25.53	27.09	23.97	25.53
2 years.....	7.22	6.87	7.04	1.25	1.12	4.12	4.21	4.04	4.12
3 "	3.75	2.70	3.30	0.39	0.31	1.79	2.06	1.53	1.79
4 "	1.61	1.87	1.78	0.28	0.31	1.02	0.94	1.10	1.02
5 "	1.84	1.44	1.68	..	0.12	0.85	0.91	0.79	0.85

From birth to five years:

	Legitimate			Illegitimate			Total		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.
	40.58	34.13	37.36	30.05	26.08	28.06	35.17	31.48	33.42

Of 100 deaths:

1 month	3.92	3.57	3.72	11.54	9.80	10.68	15.46	13.32	14.40
2 months	1.48	1.48	1.48	1.08	1.09	1.09	2.56	2.58	2.57
1 year.	13.62	10.68	12.16	14.96	13.02	13.99	28.58	23.70	26.15
2 years	3.77	3.46	3.62	0.66	0.54	0.60	4.44	4.00	4.22
3 "	1.96	1.39	4.68	0.21	0.15	0.18	2.17	1.54	1.86
4 "	0.84	0.94	0.89	0.15	0.15	0.15	0 99	1.09	1.04
5 "	0.96	0.72	0.84	..	0.06	0.33	0.96	0.78	0.87

From birth to five years:

	21.17	17.21	19.20	15.99	14.24	14.96	37.16	31.45	34.16

The number of still-births is twice as large in illegitimate as in legitimate cases; in the first three months, in many countries, mortality is twice as large; up to the fifth year the mortality of illegitimate compared with that of legitimate is 10.5:6. At Berlin, from 1813 to 1820, 20 per cent. of infant deaths occurred in illegitimate children, while their birth rate was but 16 per cent. of the legitimate.

Deaths under a year in 100 born alive in Berlin:

	1865.			1866.			1870.			
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.	Grand Total.
Legitimate	30.76	26.88	28.87	27.16	18.54	22.92	37.16	31.52	34.34	37.80
Illegitimate	48.98	40.18	44.71	33.59	28.23	31.35	61.91	55.08	58.50	

In Breslau:

	1865.			1866.		
	Male.	Female.	Total.	Male.	Female.	Total.
Legitimate	32.21	29.10	30.69	38.90	33.28	36.12
Illegitimate	52.64	57.42	57.97	50.68	45.00	47.76

In Bohemia, 1869:

	Legitimate.			Illegitimate.			Total.		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.
1 month	12.01	9.21	10.65	19.04	15.70	17.40	13.02	10.16	11.58
2 months	2.82	2.21	2.65	4.49	4.26	4.35	3.06	2.45	2.82
1 year	26.73	21.79	24.33	38.95	34.36	36.69	28.49	23.64	26.13
2 years	5.17	5.38	5.28	5.00	5.01	5.01	5.15	5.33	5.23
3 "	2.46	2.64	2.55	2.17	2.20	2.18	2.42	2.57	2.49
4 "	1.65	1.53	1.54	1.15	1.12	1.12	1.49	1.47	1.48
5 "	1.09	1.11	1.70	0.72	0.75	0.74	1.03	1.06	1.05

Circumstances, occupations of parents, care and food, are known to have a considerable influence. Of 100 deaths at Paris in 1817-24 (those who died in hospitals not included):

	0-1 year.	9-10 years.
Occurred in the first "arrondissement"—comfortable	17	37
In its richest portion	14	32
In the twelfth arrondissement—poor	25	50
In Monuffetard street—very poor	32	59

In London (1844) of 100 infants born alive to the gentry, 20 died; to the working classes, 50. In the aristocratic families of Germany, 5.7 per cent. died within five years; amongst the poor of Berlin, 34.5. In Brussels the mortality up to the fifth year was 6 per cent. in the families of capitalists, etc., 33 amongst tradesmen and professional people, 54 amongst workingmen and domestics.

A few more figures and we shall have done. Of 100 new-born the death rate amounted to

0-1 yr.	0-2 yrs.	
23	47	in the foundling hospital of Lyons—breast milk.
53	65	in the foundling hospital of Paris—mixed feeding.
63	71	in the foundling hospital of Rheims—artificial food.

Amongst the above figures relating to Lyons there are numbers of babies nursed by their own mothers, and such as were nursed by strangers.

The mortality of those nursed by their mothers, up to the end of the first year, was 2.8 per cent.

The mortality of those nursed by strangers amounted to 30 per cent.

Even under the most favorable circumstances the difficulties of raising the infants are very great. Whitehead found, of 952 mothers observed in the Child's Hospital of Manchester, but 629 in good health, 420 secreted a copious and healthy milk for a sufficient period, 95 proved but tolerably competent and 95 incompetent wet-nurses.

The mortality of foundling hospitals has always been very unsatisfactory. Before the end of their first year, of 100 abandoned infants, there died in

Paris	1789	60
Vienna	1811	92
Madrid	1817	67
Dublin	1791-98	98
St. Petersburg	1772-84	85.6
"	1785-97	76.2
"	1830-33	50
Brussels	1811	79
"	1817	56
Belgium	1823-33	54
Moscow	1822-31	66
Irkutsk		100

Improvements have taken place since greater care was taken, the food of better quality, wet-nurses engaged, the infants farmed out. But still, at Bordeaux, the mortality differed greatly in the foundling hospital and the population in general.

The following statistics are also conclusive:

The mortality of infants under a year, amongst the workingmen of Lyons, is at least 35 per cent., according to Devilliers; in well-to-do families it is 10, and in well-to-do agricultural districts.

The average mortality of infants under a year is 16 in 80 of the departments of Normandy, and 15 amongst all France.

The mortality of all the new-born in France is 16 per cent. up to the end of the first year, according to the official investigations of Heuschling. Compare with this percentage the following table containing the mortality of children less than a year old in four districts of the Département d'Eure et Loire.

	1854.	1855.	1856.	1857.	1858.	1859.	Average.
Chartres.....	30.22	25.23	23.86	22.88	22.43	29.21	25.63
Chateaudun.....	26.46	30.59	29.46	30.28	28.49	36.40	30.28
Dreux.....	23.18	27.32	23.17	31.95	24.90	35.21	27.62
Nog. le Rotorn	51.67	56.53	47.20	59.06	50.42	43.00	51.33

And, further, remember the fact that the mortality of the infants born in these districts is much less than this average, thus rendering the average mortality of the little Parisians sent in charge there much more fearful. We can easily understand, then, the following results of official investigations.

Of the infants sent out by the "general direction of nursed children," and completely watched, the mortality under a year is 17 per cent., but 1 per cent. more than the above average mortality.

Those sent out on the same conditions, by private offices, and not watched, exhibit a mortality of 42.

The "assisted" infants of Paris, sent out by the above "general direction," on the same conditions, but always in poor health, have a mortality of 55.

Amongst the foundlings of the Département d'Eure et Loire which are bottle-fed, and frequently many by one woman, the mortality is from 60 to 75.

Thus the difference in the care taken of and the food given the little ones gives rise to a difference of from 17 to 75 per cent. in their mortality. As absolute necessities, Mr. Husson urges the shortening of the stay of the infants

at the general hospital, and their transfer to the country, by means of doing away with many administrative formalities; further, to omit vaccination at such early period of life, and just before starting, and to increase their comfort while travelling. He urges it the more as the foundlings form more than one-half of the assisted children, altogether 2.03 per mille of the whole inhabitants of France.

Mortality at Bordeaux in 1,000 children born alive:

Age	Found'g hosp.	Total pop. of France
0- 1	517	232
1- 2	122	96
2- 3	40	47
3- 4	15	26
4- 5	14	15
5- 6	4	10
6- 7	2	7
7- 8	8	5
8- 9	3	4
9-10	4	4
0-10	729	446

Of 1,000 children in France 554 reached their tenth year; of 1,000 foundlings, but 271.

Wasserfuhr has the following statistical contribution to the same fact. Of 1,113 children of Stettin, North Germany, who died before the end of their first year, there were:

	Illegitimate.	Workingmen.	Mechanics.	Small traders.	Ill-paid officials.	Well-to-do.	Total.
1858.....	102	166	93	112	51	14	556
1859.....	147	166	73	112	52	15	557

Of the whole population of the city 12.06 per cent. were in comfortable circumstances, 87.94 per cent. were in

middle circumstances or of the working classes. Of the dead children, however, but 2.52 per cent. belonged to the former, 97.48 to the latter.

A further illustration is yielded by the official statistics of the Grand Duchy of Baden. The official report takes as granted the fact that the Jewish population of the country is more careful in the rearing of their babies than the rest of the population. The two classes stated enjoy the same circumstances, climate, and soil. The former lose 15 per cent. of their children, the latter 26 per cent., before they reach the end of their first year.

In 100 contemporaneous births in the countries of Europe 4.75 are still-born. Of 100 deaths in the total population 25.6 take place in the first year, and from the first to the fifth year 15 more. A more accurate list of the yearly percentages is the following:

Mortality under	Per cent.	Mortality under	Per cent.
1 year	26.5	8 years	0.62
2 years	5.6	9 "	0.56
3 "	2.6	10 "	0.46
4 "	1.8	11 "	0.42
5 "	1.35	12 "	0.38
6 "	0.99	13 "	0.38
7 "	0.78	14 "	0.36

Such is the average; but the differences are great. Thus in Germany the rate of mortality in the first year varies between 14 and 40 per cent. This difference is due to the degrees of general physical and mental condition of the population. Thus, sometimes, vast differences are found in neighboring countries. As a rule poverty, brutality, and mortality go hand-in-hand. This is not more wonderful than that from century to century, with increasing civilization, mortality should have decreased and the average duration of life increased.

In the next five years mortality is less, as stated. Here, too, we meet with great differences. The average is 15. But while it is 17 in Prussia it is 8 in Baden.

To what extent external influences, management, etc.,

will bear upon infant mortality is shown also by the deaths amongst the foundlings of Prague, inside and outside the Foundling Hospital, within the first year of life:

Year	Per cent.	Year	Per cent.
1857	82.97	1864	77.52
1858	90.46	1865	62.46
1859	87.07	1866	60.14
1860	86.95	1867	54.07
1861	89.71	1868	46.68
1862	88.79	1869	46.08
1863	93.19		

According to the above table the years 1857 to 1863 exhibit a frightful mortality. The history of these years yields a clue to this remarkable fact, for from March, 1857, to June, 1864, the institution was removed from the care of its former authorities and placed under the charge of the Sisters of Charity of the order of St. Carolus Borromæus. They were paid for every child in the institution. Now, the feeding of breast children makes no expense, but wet-nurses are expensive. Therefore, the house was crowded with infants, and the wet-nurses reduced in number to such an extent that one of them had to nurse three or four babies. In addition part of the house was retained for the use of the Sisters, so that finally 80 or 100 infants had to be satisfied with the space formerly occupied by 42. Thus the mortality of the hospital rose instantly from 41 to 66, and in 1862 the total mortality attained the high figure of 83 per cent. At the same time the mortality among the boarded-out children was by no means small, it being 48 in 1859. It still continued rising, being 54 in 1863, after Prof. Loeschner, a celebrated physician and humanitarian, insisted upon removing the infants to the country. His error consisted in looking for the cause of death in the crowded condition of the house only. Thus a smaller number remained, but the proportion of the wet-nurses remained the same, and consequently the mortality also. The infants sent away were in the majority puny, feeble, almost moribund, and swelled

the average rate of mortality. It required some years before the effects of the former mismanagement could be extinguished.

Last in order, not least, is the question where foundlings ought to be raised—in institutions or in private families?

Places inhabited by many can never yield an atmosphere as fit for breathing as well-kept private residences. Moreover, young infants, in consequence of their delicate constitution and their not producing vital warmth by physical exercise, are confined to the house and room during the greater part of the year and day. Besides, offensive admixtures to the atmosphere of rooms in which many children are living cannot be avoided. Even the institutions in which adults are kept suffer from the same influences to such an extent that not infrequently the very entrance into such a place is a guarantee of imminent disease, and portions of hospitals have sometimes to be closed. Alvine discharges and urine contaminate the air of infants' wards to a considerable degree. From this source originate the numerous cases of poor sanguification, and of constitutional diseases such as rickets, scrofula, etc., even typhoid fever and scurvy. From this source comes part of the really immense mortality of foundling hospitals. Whenever the attempt is made to correct this cause of disease and death you will find that this attempt is punished at once. Ventilation is never complete except by opening windows. To relieve the wards of their unbearable stench —I advise you to visit a large, fine-looking, whitewashed, clean ward in a foundling hospital, in a nursery and child's hospital, at 6 A. M.—you open the window, and in come the enemies of mucous membranes: intestinal catarrh, entero-colitis, bronchial catarrh, pneumonia. Of 88 deaths in the Nursery and Child's Hospital, New York, more than 40 are due exclusively or partially to pneumonia. These facts have been the cause of the universal changes in the rearing of the infants left on the hands of society in all Europe. At present the former foundling institutions are

nothing but depots for temporary admission and speedy distribution about the country.

There may be drawbacks, also, as far as private boarding is concerned. But where, in such an individual case, or a number of individual cases, changes are required, they are easier to make than in institutions, which, as a rule, are more than comfortably filled.

Even if the feeding is the same in private boarding and public institutions, the results are more favorable in the former category. That a baby should live and thrive on artificial food in a private family is by no means a rare occurrence. Every attentive person, every medical man, has ample opportunities for such observations. That, however, bottle-fed babies in a public institution should survive is a rare exception. In the wards of infants' hospitals everywhere the receiving of a baby in the purely bottle-fed department is acknowledged by all as amounting to a sentence of slow death. Moreover, the only article of food without which a baby could not be kept alive—viz., milk—can be more regularly procured by the poorest countrywoman than by the richest and most circumspect institution.

Besides, the nurses of institutions having charge of a number of infants at once, by day and by night, are very apt to, and surely will, lose the self-sacrificing patience and the everlasting attention which are absolute requisites for the sustenance of a young human being.

A task that requires all the holy instincts, the self-immolating, restless care of maternal love, is left sometimes in the hands of corrupt, lazy, whimsical, or malicious women, who make it their business to neglect their business, and are womanly and motherly only as far as they are so anatomically. It is much more probable that the poorest countrywoman who takes charge of a society's child, under the superintendence of the proper authority, under the eyes of her neighbors, and with motherly feelings developed in the poorest one bound in marriage and family ties, will succeed in saving a nursling from certain death.

A further reason why infants should be raised in the country, even under equal circumstances, is the statistical

fact that they will thrive better. Of 100 children born alive there died before the fifth year:

	Years	In the cities	In the country	Difference
France	1853-54	35.69	28.56	7.13
Holland	1850-54	36.25	28.90	7.35
Sweden	1851-55	38.86	24.50	14.36
Denmark	1850-54	29.66	22.68	6.98
Sleswig	1845-54	27.42	23.42	4.00
Holstein	1845-54	29.92	25.29	4.63
Saxony	1847-49	39.88	36.22	3.66
Hanover	1854-55	28.70	26.47	2.23
Prussia	1849	36.02	29.47	6.55
Average		33.60	27.28	6.32

Of 100 deaths, of all ages, in England there were:

	Up to end of sec. yr.	Up to end tenth yr.
In all England	31.58	44.91
Cities with 100,000 inhabitants or more.	35.12	51.39
Cities with less than 20,000	31.49	46.79
Manufacturing country districts	35.36	45.90
Agricultural districts	24.33	35.40

Mr. Husson urges even the shortening of the preliminary stay of the foundlings at the central depot, although a number of wet-nurses are kept there, and wants them transferred to the country instantly.

If any further proof was required it might be found in the contribution of one of the members of the undersigned committee, who reports as follows:

"He has, during several years past, assigned a few ladies having comfortable and eligible homes in the outer parts of, and some of them completely out of, the city of Rochester, in caring for children that ordinarily would have been placed in charge of a wet-nurse, could such have been found. The difficulty in securing good and reliable nurses has induced many mothers and fathers in moderate circumstances to place their infants as boarders with these matron women, some of whom will care for

from four to six children. He has thus provided for many motherless young children, with such results as to justify him in continuing this course. There is no foundling hospital in that district. Five or six years ago one was attached to the St. Mary's Hospital of that city, but was soon abandoned. In the Rochester City Hospital, with which he has been long connected, repeated efforts have been made to have such a department instituted. He has always opposed it."

THE FOUNDLING ASYLUM OF THE SISTERS OF CHARITY IN THE CITY OF NEW YORK

Of the Foundling Asylum of the Sisters of Charity in the city of New York we can give but few statistics, inasmuch as nothing is known concerning that institution, except what has been published in a report of its doings from its opening, October 11th, 1869, to October 1st, 1871. The tables given on pages 10 and 11 of that report being very incomplete, your Committee has tried to obtain some more detailed statistics from the officers or the books of the institution, in order to lay the results of its examination before the State Medical Society. One of your Committee applied, for this purpose, to one of the lady superintendents, and was told "that there were no records, except those kept by the physician of the institution, who had a part of his books at the Asylum and a part at his own house." Requested to recommend that these books be laid open to examination, the lady referred your applicant to a reverend gentleman known as the superior of the institution. He, in turn, stated that he had "personally" not the slightest objection to such an examination of the books, but that, before deciding whether or not to permit it, he must think the matter over. Your Committee then applied to the attending physician of the Asylum in the following terms:

"*Dr. Reynolds, 29 West 14th street, New York.*

"DEAR SIR:—As I am about reporting to the State Medical Society on Foundlings, Foundling Hospitals, etc., for which purpose I have also availed myself of the statements and figures

contained in the Report of the Catholic Foundling Asylum, as lately published, I take the liberty of hereby requesting you to permit me to look over your official records.

"Sister Irene has stated to me that the only complete records are kept by the physician of the institution, and Father Starrs says he has no objection to my so doing; still he has not given any direct permission, evidently reserving his final decision for further consideration or your consent.

"By informing me if, when, and where you will consent to my inspection of the records of the Catholic Foundling Asylum, you will greatly oblige,

"Yours most respectfully,

"Dr. Jacobi.

"110 West 34th street,
January 29th, 1872"

The answer we received, after a little delay, was the following:

"29 West 14th street,

"*Dr. A. Jacobi.*

"Sir:—The official records of the Foundling Asylum of the Sisters of Charity are in the possession of the authorities of the Asylum. I refer you to them.

"Respectfully yours,

"J. B. Reynolds."

After receiving this letter we called on the superintendent and treasurer, Sister Irene, referring her to the above letter, and requesting her to permit us to examine the books, repeating to her, at the same time, the meaning and object of our request. She said she could not do so without first conferring with the officers of the institution, and that she would send an answer speedily. That answer read as follows:

"New York Foundling Asylum.

"*Dr. Jacobi.*

"Dear Sir:—After consulting with the Directors of our institution, we see no reason to depart from our rule in your case. The published report contains an accurate statement of all matters on which you are interested.

"Yours very respectfully,

"Sister Irene, Treasurer.

"February 3d, 1872."

We must confess that we were not aware that our interest in foundling institutions, and in this Foundling Asylum of the Sisters of Charity in particular, had been exhaustively satisfied by what the report of 1871 was willing to publish. And for that very reason, and for the information of the State Medical Society, we thought it of importance to look over the records of the institution, in order to arrive at the correct and complete statistics which the tables on pages 10 and 11 of the report do not yield, hoping that the same liberality would be extended which has always been shown by the Commissioners of Charities. The fact is, that the physician himself who writes the report states that the records of the first year had been but indifferently kept; probably because, as he says on page 7, "when the task was undertaken, neither the Sisters nor the physicians had any idea of its magnitude," and because "the cares and responsibilities incident to the rearing of infants were new to the Sisters."

The report, which is herewith submitted, informs us (page 11) that "up to October 1st, 1871, 2,560 infants had been left at the institution; and of this number 1,377 were received between October 1st, 1870, and October 1st, 1871." A pretty careful report, as it appears, is given of the condition upon entrance of these 1,377. But the principal question which arises in our mind is: How many of those 2,560 infants left since October 11th, 1869, are alive this very day? And the further question: How many of the 1,377 children left between October 1st, 1870, and October 1st, 1871, have lived any length of time after the latter date? and "How many will have lived to see the end of *their* first year?"

From the table (page 11) we learn that 40 per cent. of the 1,377 infants left during the second year were alive at its close, October 1st, 1871; 4 per cent. were reported discharged, and 56 per cent. dead. At all events, as we have no statistics of the previous year, we have no right to assume that such of the 1,377 admitted during the year as were surviving at its close will every one live and not go to swell the percentage of yearly mortality. It is safe to assume that a large number of those admitted during the

year, especially of those admitted at very early age, and living October 1st, 1871, have died since that date, or will die before reaching the end of their first year. If the records of the last two years had been carefully kept it would be found, and if the records of the next year or two will be correct it will be found, that following up every single infant or child from its admission to its discharge or death, the rate of mortality given, 56 per cent., is far below the truth. A slight mistake in the account is also the following, if our way of comparing the living with the dead is the correct one: Of the 1,377 there are 51 discharged, which ought not to be counted at all. Of the remaining 1,326, 554 are alive, 41.7 per cent., and the rest, 58.3 per cent. died according to the figures of the report. As it is, and it would seem against their wish, the managers of the Foundling Asylum of the Sisters of Charity have been obliged to withdraw a number of children from the bad influences of hospital wards. They say they have been compelled to board many babies out, "as the Asylum is too small to accommodate all the children" (page 5); thus indicating their tendency of accumulating the babies within an institution. They are compelled to give up this tendency from the facts stated by the attending physician, who, speaking of the first and smaller institution, admits (page 8) that "the results of overcrowding soon became evident in daily increasing mortality." It is but fair to state as his opinion, which, however, is not borne out by facts: "Experience [of one year!] forces us to acknowledge that the chances of rearing infants in a well-regulated institution, with large, sunny, well-ventilated wards, are fully as good as in the outside nursing or boarding." And again (page 13): "It would be unfair to attribute the larger mortality in foundling hospitals chiefly to causes to be found within the hospital. We should consider the condition in which the infants are received." Which remark is followed by this exposition by the medical gentleman: "Some are exposed carelessly or unavoidably to cold in their transit to the hospital, entering seemingly perfectly healthy; but in a few hours the extremities become wrinkled and shrivelled,

Present capacity of the Institution.		Number of Infants																			
		In the Institution Dec. 31st, 1869.		Received during the year 1870.		Placed out at nurse during 1870.		Remaining out at nurse Dec. 31st, 1870.		Sick belonging to the institution Dec. 31st, 1870.		Taken sick during 1870.		Received in a sickly and dying condition during 1870.		Received after premature birth during 1870.		Died inside during 1870.		Died outside during 1870.		Discharged during 1870.	
Adults.	Infants.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
40	85	20	61	727	672	353	320	257	130	14	13	198	92	206	290	58	46	304	236	106	180	98	84

Up to October 1st, 1871, 2,560 infants had been left, and of this number 1,377 were received between October 1st, 1870 and October 1st, 1871. The following table will show the condition in which these 1,377 infants were received, how many are living how many have died, and the cause of death:

Whole number from October 1st, 1870, to October 1st, 1871.	Condition upon Entrance.						Living.	Discharged.	Died.		Diseases which caused Death								
	Good.	Poor.	Dying.	Premature.	Exposed.	Syphilitic.			Died in hospital.	Died at nurse.	Intestinal.	Pulmonary.	Broncho-intestinal.	Prematurity.	Syphilis.	Inanition.	Erysipelas.	Convulsions.	Various.
1377	526	479	153	132	37	50	554	51	347	425	462	55	83	84	49	14	4	13	*

* 1 purpura hæmorrhagica; 2 basilar meningitis; 1 intestinal perforation; 1 chronic hydrocephalus; 2 measles; 1 small-pox. The figures relate only to the year from October 1st, 1870, to October 1st, 1871.

the skin upon the hands and feet harsh and dry, feeling like thin parchment, and too large for tissues within; jaundice ensues and deepens day by day, while the body diminishes in weight, and the little ones quietly sleep into death."

As your Committee labors under peculiar difficulties in having nothing to lead them but one report, we again direct your attention to some figures contained therein. You will find that in the last year recorded there are said to have been 1,377 admissions and that there are 554 living. We may admit the latter, inasmuch as the financial report states (page 16) that the City Comptroller paid to the institution, as per capita allowance, $39,084.67 from October 1st, 1870, to October 1st, 1871. The amount paid by the city to this private charity being $8 monthly for every child they take care of, that sum covers 4,885.5 monthly or 407.67 annual boards. Thus, when we take into account that there are a great many more boards to pay in the last months for those who have not yet had time to die than in the former months of the year, the figure is herewith assumed to be correct. The low figure of $9,815, which has been paid by the Comptroller from October, 1869, to 1870, when 1,173 infants or children were received, proves one of two things—either that the Comptroller did not pay through all that time, or that but few babies lived long enough to swell the expenditure on the part of the city. How many of the 1,173 received in the first year have survived we do not learn; the books, as the report says, have not been well kept; but we do know from the report that 2,560 *have been received in two years, and* 554 *are reported as surviving. Percentage, it appears, according to "official" accounts,* 21.64 *alive and* 78.36 *dead.*

If there should be a mistake, which does not appear to be probable, it is the fault of the report and the impossibility on the part of the Committee of obtaining further details.

There is one feature in the management of the institution which is favorable—as it would seem, however (page 5), against the wishes of the managers. Those infants or

children who have no room in the house are boarded out. Thus, many are under the same, or nearly the same, circumstances in which the offspring of the poor die or thrive. The few ladies of the institution cannot possibly superintend those who are boarded out, except on those days when their nurses come with them to get paid. Close supervision being an absolute necessity, although an impossibility under these circumstances, the many cases of poor, puny, ragged babies seen in the public dispensaries of the city by the attending physicians, and supplied with certificates of death by them, and with coffins and transportation by the Commissioners of Charities, are easily explained. It may also be that the impossibility of a close superintendence, from want of help, has been the cause of the boarding-out of the infants in the city rather than in the country. Very few indeed are sent to country homes.

The mortality rates of the Infant Hospital on Randall's Island do not look promising; on the contrary, they are bad in proportion to the poor condition in which the infants are received, and the numerous and well-known drawbacks, principally consisting in the difficulty of obtaining proper help, that institution is suffering from. The admissions in 1869 amounted to 1,278, at an average age of 4 months and 14 days. Thus the earliest period of life has but few representatives. Of the 606 admitted in the first half of 1869 but 17 remained in the house in February, 1870. Their average age, when admitted, was 6 months and 19 days. Their average time in the hospital was 7 months, 25 days. Their average age at that time was 1 year, 2 months and 14 days. Of the rest, 227 were discharged at an average age of 12 months, 21 days. They had been admitted at an average age of 10 months, 23 days, and remained in the hospital but 1 month, 28 days. 362 deaths took place; the average ages, when admitted, were 3 months, 2 days; at death, 4 months, 11 days; and their average stay in hospital but 1 month, 9 days.

Recapitulation for that period: Total, 606. Deaths, 362; discharges, 227; remaining, 17.

But let us look over a number of years to obtain more

elaborate statistics. In the Infant Hospital, Ward's Island and Randall's Island, since the summer of 1869, there were total admissions of infants, either with or without their mothers, and including always those who remained from previous years:

	1868.	1869.	1870.	1871.
	1887	1516	1176	1088
Died	1039	710	429	271
Discharged	595	552	552	587
Remained	253	254	195	240

PERCENTAGES.

	1868.	1869.	1870.	1871.
Died	55.06	46.83	36.49	24.68
Discharged	31.53	36.42	46.93	53.46
Remained	13.41	16.75	16.58	21.86

These lists exhibit a gradual diminution of mortality, and a gradual increase of those who get discharged or remain alive. These facts are due to greater general and medical care, to the employment of a larger number of wet-nurses, and to the diminished number of admissions.

Still, the real proportions can be got at only by comparing the real admissions, those who remained of the preceding year not included.

Thus we arrive at the following figures:

	1869.	1870.	1871.
Admissions	1263	922	903
Of whom were discharged	552	552	587
The recorded deaths amount to	710	429	271

This result is very unfavorable, certainly. If you take off the discharges through the year, you have infants admitted and not discharged:

In 1869, 711 admissions; 710 deaths.
In 1870, 370 admissions; 429 deaths.
In 1871, 316 admissions; 271 deaths.

That is, a surplus of 45 living children over deaths amongst the *bona-fide* admissions (discharges deducted). You can get at the final result in still another way:

There were remaining on January 1st, 1868, and admitted during the year 1868	1887
Newly admitted, 1869	1263
Newly admitted, 1870	922
Newly admitted, 1871	903
Total	4975
Discharges in 1868	595
Discharges in 1869	552
Discharges in 1870	552
Discharges in 1871	587
Total discharges	2286
Deaths in 1868	1039
Deaths in 1869	710
Deaths in 1870	429
Deaths in 1871	271
Total deaths	2449
Total discharges	2286
Grand total	4735

These figures leave a balance of 240 living children in four years, as above, and yield the lowest rate of mortality, that of last year, *discharges not counted,* as amounting to

85.8 per cent., the percentage of those remaining alive to 14.2.

This low percentage is particularly due to the fact that a certain number of the inmates of the institution were foundlings, in the real meaning of the term, and had to be raised on artificial food. We have before us the names, etc., of these infants, as admitted in 1868, 1869, and 1870. Their number amounts to 231. Of these, as many as 17 were returned to their mothers after a short period; 19 were adopted, and 195 died, proving the absolute fatality of their condition.

The Commissioners of Charities, under whose superintendence the institution of Randall's Island is administered, deserve the credit of never attempting to conceal the facts—their own reports speak volumes—and of trying their best efforts. They have employed as many wet-nurses as they could obtain, have improved their buildings, tried to provide effective medical and other help, and have finally succeeded in reducing the death rate, and, as the figures of the reports will show, in prolonging life. Still, they are aware that their best efforts in the old methods have been greatly unavailing, and have frequently followed the advice of their medical board and house physician.

The printed minutes of the Commissioners of Public Charities and Correction of last year contain a proposition to make preparations for boarding-out babies, submitted by the Medical Board of the Infant Hospital, Randall's Island. The Commissioners have, we believe, deferred further action only in consequence of the necessity of keeping up all their numerous charities, and from their fear of not being capable of meeting a momentary increase of expenses. But lately a paper was prepared, which was intended to be circulated over the signature of the Commissioners, containing similar propositions. It is but right to say that they considered the publication impracticable at that moment, but approved of and indorsed all its contents. One of your Committee has requested and obtained permission to publish it, and has done so in an address to the Medical Society of the County of New York, which has appeared in the January number of the New York *Medical Journal*. It is written in the form of

a letter, which was to be distributed among such persons as are mentioned in it, and, with its remarks and suggestions, will explain itself. It reads as follows:

"Dear Sir:—Your special attention is herewith directed to the claims of a class of destitutes who, as they are helpless, are the more deserving of the sympathy of the just and benevolent. In their behalf the Commissioners of Charities and Correction have tried to improve the methods of supporting, raising, and educating, have built costly edifices, and gladly availed themselves of any advice their medical boards could afford them. Still, the results of their efforts are far from being satisfactory, and, after careful consideration of the difficulties to be overcome and the aims to be reached, the undersigned request you to give your attention to the following remarks, and to lend your valuable aid in furthering their endeavors.

"The class of destitutes in question are the foundlings and abandoned infants, amounting to the number of about three thousand a year, in the city of New York. Their claims have been so well acknowledged of late, and the public at large have become so conversant with the humane and political aspects of their case, that a number of associations have been formed for the purpose of either raising them or educating those who survive.

"From a report laid before them by the Medical Board of their Infant Hospital, which admits yearly about 1,200 or 1,400 of these destitutes, we gather the fearful and embarrassing fact that infants collected in large institutions of the best hygienic designs, with the most careful dietetic and medical care, will die in large numbers. This immense mortality is particularly great in earliest infancy. Of 47 deaths in New York City under five years, 39 occur under two years and as many as 30 under one year; the mortality of abandoned children under the charge of public or private authorities is still larger. The very accumulation of infants under one roof, the scarcity of breast milk obtained, the difficulty of securing competent nursing for a large number of infants, the ravages of contagious diseases, the poisoning by deleterious exhalations and excretions, etc., are just so many obstacles to the health and life of the young inmates of our public institutions. The difficulties of raising infants in our institutions, and of gathering a sufficient amount of breast milk in them, induce the undersigned to try a change with a part of their inmates. A number of them are to be given in charge of responsible parties in the country surrounding New York. The not unfavorable results of farming out even in cities, when com-

pared with the mortality of institutions, encourage us to hope that infants farmed out in the country have a much greater certainty of life and a healthy future. And with regard to this plan, we have herewith taken the liberty of sending you this communication.

"We propose to farm a number of babies out until they have reached the end of the third year. In particular cases special arrangements may be made beyond that age.

"Babies who have no teeth are expected to be fed on breast milk exclusively; such as have from two to four teeth, on mixed food. Afterward they are to be weaned according to such rules concerning the feeding of the children as shall be laid down by the undersigned or their Medical Board.

"A single party is to be entrusted with but one nursling. A medical examination only can decide whether, in exceptional cases, a woman is fit to nurse two infants. She may, however, obtain an older child in addition to the nursling.

"She must either be married or a widow, or very well recommended. She must have plenty of breast milk for the nursling in charge, no matter whether she has lost her own baby or has sufficient nourishment for two (her own and the stranger). She must be healthy, not destitute, not intemperate, and known to be industrious and not entirely dependent on the board paid for the nursling. She has to present a certificate from responsible parties—physicians, clergymen, postmasters, town authorities, or well-known citizens—concerning the above requirements, stating also how many children she has and how many she has lost.

"The applications of women who offer to take charge of infants are made at the office of the Commissioners of Charities and Correction. The depot of the babies is at Randall's Island. The house physician notifies an applicant to call for her boarder. She has to call personally. Travelling expenses are refunded. The board money is ten dollars a month, to be paid semi-monthly, monthly, or bi-monthly.

"Besides, we offer to pay twenty dollars to a party with whom a boarder has been living for sixteen consecutive months, at the end of his second year.

"These are the outlines of the principal rules which, in all probability, will govern the farming out of infants in the country. We now apply to you, sir, and your friends, for your opinion and co-operation. You can advise us if, in your circle and neighborhood, the men in standing and authority, as mentioned above, would be found willing to help the cause of humanity and an enlightened political economy by giving such certificates as parties would require, by even encouraging a party to serve her-

self and the public by taking charge of an infant, and also by paying a certain amount of attention to the little one who has no mother but the community.

"The general superintendence will have to rest with the Medical Board of the Infant Hospital. Their house physician shall be entitled to provide for special inspection. Still, it will be of the utmost importance to interest the public at large in the welfare of the foundlings, particularly the ladies, who, according to localities, might form committees for the purpose of watching and superintending the foundlings and their nurses.

"You are respectfully requested to give the foregoing your attention, and to communicate to us your opinion as to the feasibility of our plans; whether, in your opinion, a certain number of women would be fit and willing to charge themselves with bringing up an abandoned infant in your neighborhood, and whether yourself or your friends, or their ladies, would be found willing, by occasional inspection, etc., to aid our attempts in raising infants whose life is as valuable to society as our duties toward them are clear."

This letter has not been sent out, but is simply given as a contribution to the history of infant institutions in the city of New York, and the gradual improvement of the plan on which they must in future, be raised. Your Committee takes a pleasure in stating, and hopes not to betray an official secret, which it was not meant to be, that but lately an official connected with the Bureau of Public Charities has been sent out into the country to ascertain to what extent the co-operation of physicians and authorities could be secured, and to learn the willingness of country people to take charge of little ones. It is known that this first attempt has proven far from unsatisfactory.[13]

[13] P. S.—In the minutes of the meeting of the Commissioners of Public Charities and Correction, held on May 23d, we find the following report of the house physician of the Infant Hospital, Randall's Island.

INFANT HOSPITAL, R. I., May 4, 1872.

Isaac E. Taylor, M. D., President Medical Board, Infant Hospital.

DEAR SIR:—Herewith please find the usual statistical tables for the month ending April 30th, 1872.

The principal topic of interest connected with the experiences

According to the records of the Nursery and Child's Hospital, Lexington avenue, corner of 51st street, New York, 117 babies were born in the lying-in department of that institution from October 1st, 1870, to October 1st, 1871. Of this number 69 were discharged within a short time after their birth; most babies go out with their mothers within a few weeks, some remain a little while longer. The aggregate stay of the 69 little ones amounted to 108 months and 5 days. A month is always taken in our accounts as averaging 30 days; thus the average stay of each of the 69 amounts to 1 month and 17 days.

Our information on one of the rest is not positive. We do not know whether James McAlister has been discharged or died. We have not counted him among the dead. Of the other 47 babies who were not so fortunate as to get discharged, 27 died. Their aggregate ages at the time of their death were 69 months, or 2 months and 17 days per head. We have no means of knowing how many of the discharged 69 would have succumbed if they had averaged a stay at the institution of 2 months and 17 days, instead of 1 month and 17 days.

Of the 20 who remained alive within the Nursery after October 1st, 1871, 9 have been born in the last quarter of the year; 5, viz., 20 per cent., in the very last month. They had not then averaged 2 months and 17 days.

of the month has been the inauguration of the "farming-out" system, so called. But it is well to bear in mind, at the outset, the fact that the plan as at present adopted by us is no fair test of what is popularly understood, at all events in Europe, as the farming-out system. This is evident when I state that all the children, with a single exception, thus far sent into the country are walking children, and are above the age of from twenty months to two years. The results, however, even with this class of children, are thus far highly satisfactory. I have visited the children at their new homes several times, and have had further and more detailed information concerning them from my assistants who have been detailed to make inquiry concerning them. And from all this I am confident that the children are better off, in almost every respect, than when in the hospital. Now that the system is becoming known in the section where hitherto we

We wish every practitioner of medicine present in this hall to compare his own experience and statistics among the rich and the poor with these results obtained in the Nursery and Child's Hospital, where every one of the 47 has had its mother's or, in some cases, nurse's milk. Of 47 new-born babies, 27 have died at the average age of 2 months 17 days, and half of the rest were not old enough to have reached this average.

You will now be prepared for some more figures:

have confined the boarding of the children (viz., Westchester County), there is an increasing disposition on the part of the inhabitants of that locality to assist us in the enterprise, and already I have had several applications to take young infants to board. I have but little doubt that we shall soon be able to secure good homes for quite a large number of infants of the class referred to. And, with this object in view, I have not sent out the entire number authorized by the Board of Commissioners, as I have preferred to reserve a few vacancies for this younger class. I am gratified to report that the physician (Dr. Weiss) whom I have employed to look after the children has evinced a very decided interest in the project, and his services thus far have been of inestimable value to us in carrying the plan into operation. It is not a little surprising, too, to notice the interest of the German population in his district in the matter; and from my own personal observation I make no hesitation in saying that in Westchester County alone, in the near vicinity of the town of Mt. Vernon, I could easily provide good and satisfactory homes for at least five hundred children above the age of, say, two years.—E. S. Dunster, M. D.

This is the first report on the first attempt in putting into operation a genuine boarding-out system. It looks favorable enough as far as it goes. The subsequent reports of the same gentleman are written in the same tenor, no diseases of any account having occurred, and no death amongst all of the boarded-out children having taken place for several months, although, after the first report had been published as above, a number of babies under a year were disposed of in the same manner. Repeatedly the Commissioners of Charities have expressed their utmost satisfaction at the result of what was formerly considered a hazardous experiment, and by some a ridiculous undertaking.

ADMISSION OF INFANTS AND CHILDREN TO THE NURSERY AND CHILD'S HOSPITAL, OCTOBER 1ST, 1870, TO OCTOBER 1ST, 1871, BETWEEN THE AGES OF ONE DAY AND NINE YEARS ONE MONTH:

	Admissions.	With aggregate ages. Years.	Months.	Days.
October, 1870.....	25	22	5	23
November, "	22	35	11	27
December, "	21	27	7	27
January, 1871.....	22	14	4	4
February, "	18	23	4	26
March, "	17	38	11	9
April, "	21	30	10	8
May, "	17	24	8	3
June, "	19	37	0	3
July, "	27	37	5	8
August, "	26	43	1	25
September, "	18	25	7	13
Total	253	361	9	26

Thus the average age of 253 infants or children admitted in good health from October 1st, 1870, to October 1st, 1871, amounted to 1 year, 5 months, 16 days. We naturally lay stress on the fact of their health being good when they were admitted; for it is the rule of the institution that it shall be so. This much is sure, that no child has died this year of a disease contracted before it entered the Nursery. Still, so great is the ability of the inmates to fall sick in the institution that the secretary of the Medical Board publishes, in the annual report gotten up in 1870, the unnatural fact that 2,000 serious cases of sickness occurred in one year among 377 admissions; and in that of 1871, over 1,400 cases of sickness in 358 admissions.

Of the 253 admitted from October 1st, 1870, to October 1st, 1871, 128 were discharged within a short time after their admission. We will presume they were all in good health when they left the institution.

		Discharges took place.	Aggregate stay, in days at the Institution.
October,	1870.....	12	761
November,	"	10	755
December,	"	16	1049
January,	1871.....	12	393
February,	"	11	800
March,	"	10	666
April	"	12	316
May,	"	8	274
June,	"	8	283
July,	"	17	848
August,	"	7	304
September,	"	5	132
Total	.....	128	6581

Thus the average residence of each of the 128 inside the Nursery amounts to 1 month, 21.4 days.

If you compare the enumerated discharges and admissions in the several months with the deaths, or if you will take the trouble to look over the records we have before us, you will reach the number of babies remaining alive in the institution:

		Admissions.	Disch'd since.	Died since.	Remain alive.
September,	1871.....	18	5	4	9
August,	"	26	7	3	16
July,	"	27	17	4	6
June,	"	19	8	7	4
May,	"	17	8	4	5
April,	"	21	12	9	0
March,	"	17	10	3	4
February,	"	18	11	3	4
January,	"	22	12	8	2
December,	1870.....	21	16	2	3
November,	"	22	10	8	4
October,	"	25	12	12	1

After all there were 125 *bona-fide* inmates who stayed more than the average of 1 month, 21.4 days. Of these died:

		Aggregrate ages.		
	Inmates.	Years.	Months.	Days.
October, 1870.....	12	7	1	8
November, "	8	6	6	20
December, "	4	0	11	28
January, 1871.....	8	3	10	0
February, "	3	1	8	1
March, "	3	3	0	25
April, "	9	11	10	2
May, "	4	2	6	4
June, "	7	8	11	12
July, "	4	3	1	19
August, "	3	2	6	27
September, "	4	5	9	21
Total	69	58	00	17

Necessarily we must expect some more to die. Up to November 19th, 1871, one, who was admitted at the age of 1 year 3 months 21 days, died at the age of 1 year 7 months, on November 19th, of pneumonia. Thus, up to the date of November 19th, there were 70 deaths among 125 healthy children admitted to the Nursery. The average age at the time of death was 10 months, 7 days.

The causes of death are attributed, in 1 case each, to croup, pleuro-pneumonia, entero-colitis and peritonitis. measles, pneumonia and croup, scarlatina and croup, diarrhœa and broncho-pneumonia, pleuritis, intussusception, broncho-pneumonia, atelectasis (child of 11 months, 4 days), pulmonary tubercle and pneumonia, measles and pneumonia, diphtheria, pulmonary tubercle; in 2 cases each, to marasmus, hypostatic pneumonia, measles and croup, cholera infantum, whooping cough; in 3 cases each, to tuberculosis, atrophy, measles; in 4 each to chronic diarrhœa and pneumonia; in 6, diarrhœa; 10, chronic diarrhœa; 13, pneumonia.

Of these 70 deaths, 18 occurred in children over a year,

52 in such as were less than a year old. But 3 of the former children had been admitted before they were a year old—viz., 2 were admitted at 10 months, 1 at 11 months, 18 days. They died when they were 1 year, 2 days; 1 year, 17 days; 1 year, 2 months, 7 days old. Thus we arrive at a sum of 55 deaths among babies who were admitted before they were 12 months old. A large number of them had reached nearly that age at the time of their admission.

But how many babies were admitted under a year, of whom 55 could die within the short space of time reviewed in this retrospect?

Of the total of 253 admitted, 42 were over 3 years, 30 between 2 and 3, 44 from 1 to 2 years—together, 116 over 1 year. Of these 116, 76 were discharged in a short time. Of the remaining 40, 15 (18 less 3) have died within this limited time—a percentage, for the time being, of 37.5 among children over a year, very many of them over 2 and 3 years, and all of them entrusted to the Nursery in perfect health.

Of the 135 admitted at less than a year, 52 were discharged after a short period; 83 were left in the Nursery as *bona-fide* inmates. Of these 83, the number of 55 died within the limited period which is the subject of this compilation. The aggregate ages of these 83 at their admission was 377 months; the average, 2 months, 23.8 days.

Thus it results that the mortality of babies entrusted in good health to the Nursery, at the age of nearly 3 months, within this limited period, is 66.26 per cent.

The aggregate ages of the 55 at the time of their death, including those 3 who passed their first birthday while in the institution, count up to 26 years, 11 months, 1 day; the average age of each to 5 months, 26 days. As their average admission took place at 2 months, 23.8 days, they lasted 3 months and 2 days each in the institution.

Some questions submit themselves very readily:

1. What will happen to those who have reached, like the dead, the end of their sixth month by this time, and will stay in the institution to the full end of their first year? For the average ages of those 18 above mentioned, who

were admitted before October 1st, 1870, and died after my former report was made, amounts to 10 months, 6 days.

2. Was it fortunate or not for the 128 discharged children to stay but 51.4 days in the institution, as the time averaged between admission and death is 3 months, 2 days?

3. What is likely to become of the 20 living babies born in the place, and remaining at the present time in the institution, provided their stay is extended to the end of their first year? On the 20th of November their average life was a trifle more than 6 months, and up to that period 27 out of 47 (57.45 per cent.) had died.

4. If 66¼ per cent. perish among healthy infants admitted, as those of the Nursery, at an average age of 2 months, 23.8 days, what would be the percentage if the babies were admitted at birth under the same circumstances?

To facilitate the answer to this latter question, I beg to compare the following facts:

Of 100 Newly-born Infants, died in:

	Belgium, 1840–50.	Holland, 1848–53.	Austria, 1851.	Sardinia, 1823–37.	France, 1853.
0– 1 month	5.18	4.70	10.96	11.14	6.60
1– 2 months	1.76	2.29	2.55	1.87	2.85
2– 3 "	1.27	2.09	1.96	1.43	
3– 4 "	1.08	1.91			
4– 5 "	0.86	1.48	3.42	2.51	2.39
5– 6 "	0.76	1.19			
6– 7 "	0.72	1.77			
7– 8 "	0.66		2.40		
8– 9 "	0.66	1.42			
9–10 "	0.65			4.89	3.15
10–11 "	0.63	1.29	2.78		
11–12 "	0.80				
0–1 year	15.03	18.14	24.07	21.84	14.99

From this table, which has been taken from official documents, it is evident that the mortality of babies who have reached the end of their first quarter is but one-third or one-sixth, for each following quarter, of what it would be from the first hour to the end of the third month of life. It appears, then, that the admissions at the Nursery and Child's Hospital take place at an average age when the principal danger to life is already passed. Still, it is, in a limited period, 66.6 per cent.

We think we might go on *ad infinitum* with the practical conclusions. We want to draw but one conclusion—viz., *that the attempt to raise babies in great institutions, even with large means to help you, cannot be justified; that these institutions must be given up and reserved for other purposes, and that the only system worthy of being sustained is to place the children out with private parties.*

We claim that the preceding figures are correct, and our conclusions warranted by facts as given above. We also claim that our report as herewith presented was ordered by you, and written by your Committee, for the purpose of arriving at the truth, and not of satisfying any personal ends. We have not forgotten that it is undignified and low to regard personal motives and ends as anything in comparison with the requirements and necessities of society and the dictates of justice. Therefore, we were of the opinion that we had to deal with institutions, not with persons; with principles, and not with individuals. The names and persons of those who superintend the several institutions spoken of are of no account to you or to your Committee. *If the best names of land were at the head of the government of the country or an institution, they would be liable to make mistakes, and to see their best efforts thwarted* BY A FAULTY SYSTEM. *Not to fight systems and principles which are found to be wrong and to work badly, is the domain of those who are too lazy to think, too cowardly to disagree, too menial to resist those in power.* If there were no thoughtful, courageous, and self-denying members of society, there would be no safeguard against social iniquity, misrule, and despotism.

It is with deep sorrow, therefore, that we have to record

the fact that plain statements have been answered by insults, search for truth by calumnies. You will be astonished to read the following editorial, published but a few days ago in one of the great New York daily papers:[14]

"ASYLUMS FOR INFANTS

"The *Post* has blundered. It commends to the Legislature the opinions of Dr. Jacobi, who happens to be President of the Medical Society of New York, as worthy of their attention. Dr. Jacobi was put out of the Nursery and Child's Hospital for misbehavior, personal and professional, if not malpractice. He has crammed his inaugural address with diatribes and false statistics and misrepresentations of the institution in which he was not permitted to act as a physician. He does not discuss the general topic, which deserves discussion, whether a child's hospital should be kept at a minimum number and as large a part as possible to be distributed in private families or small and widely separated houses under hospital management. He merely rants. He makes no comparison of the results at the Foundling Hospital, the Nursery, and the public institutions on the island —which is probably accounted for by his 'vast researches during several trips to Europe'—and he comes to the sapient conclusion that these institutions must be given up, and that 'the only system is to place the children out with private parties.' The problem is far from such easy solution. His readers—if so much spleen and malice can procure him readers—will not forget how England rang from one end to the other but a few weeks ago with denunciations of the horrors and the apparently irremediable abuses of this very system which Jacobi, M. D., has judged to be 'the only system' ever since he was put down the steps of the Nursery and Child's Hospital."

We have good reasons to believe that the writer of this indecent and shameless attack will be sorry for it before long, when he studies the sources from which his "information" was obtained. The history of Dr. Jacobi's "expulsion" from the medical staff of the Nursery and Child's Hospital is known to the medical profession from the reports published by medical journals. The "horrors of this very system" (?), with "the denunciations of which all England rang from one end to the other," consist of a

[14] The *World,* February 4th, 1872.

newspaper report concerning a single criminal woman who made a business of starving and destroying a dozen babies at a time; and the chronology of some of the above statements is rather erroneous, when we remember that Dr. Jacobi's report, ordered and printed by the Commissioners of Public Charities and Correction, was written and read in a meeting of the Medical Board of the Infant Hospital —George T. Elliot, President—and published nine months before the connection of Dr. Jacobi with the Nursery and Child's Hospital was put to an end. As " false statistics and misrepresentations " are imputed, however, we take the liberty of laying before you a few of the monthly records of the Nursery and Child's Hospital, in order to satisfy all whom it may concern of the manner in which your Committee has done its duty, and of the genuineness of our sources, which we should be glad to verify by an *official and impartial investigation.* (See pages 298-300.)

After all, your Committee would not lay too much stress on all the expressions of large daily papers, or other papers or journals, which are apt to be influenced by personal regard for interested individuals. Those who have personal ends to look after will avail themselves of all the facilities and influences within their reach, of personal connections; those, however, who work in the service of a principle and truth have no time or labor to waste. Thus the battle between personal ambition and prerogative on the one hand, and the seekers after truth on the other, is always a protracted one. Still, we trust that the labor in which you are engaged will not be lost. Many of the public papers have now and then, though cursorily, paid some attention to your research, as soon as they obtained a knowledge of its being instituted. As an example we quote a part of an editorial from another New York daily:

" Probably no one will doubt that the motives of the good people who have interested themselves in the Child's Hospital are pure, generous, and praiseworthy. But it is evident that there must be carelessness, a lack of administrative ability, or worse faults, somewhere, or we should witness more favorable results from the zealous charitable efforts which appear to have been in some manner misdirected in these quarters. And when two

ADMISSIONS TO THE NURSERY AND CHILDS'S HOSPITAL (DEATHS KNOWN UNTIL NOV., 1871, ONLY). October, 1870.

Names.	Age at admission.			Age at discharge.			Age at death.			Diagnosis.
	Yrs.	Mos.	Days	Yrs.	Mos.	Days	Yrs.	Mos.	Days	
Ida Sampson	2	3	....	2	3	11	....	....	....	.....
James McLean	....	2	....	....	3	11	....	....	....	.....
J. E. MacMahon	1	1	....	....	....	....	1	1	27	Chronic diarrhœa and pneumonia.
J. W. Malloy	....	1	12	....	....	....	....	10	15	Rubeola.
Emma Johnson	....	4	....	....	....	....	....	10	....	Pneumonia.
Hester Lynch	2	5	....	2	7	21	....	....	....	.....
Edward Adams	1	....	....	1	2	....	....	....	....	.....
Mary Jane Jarvis	....	2	....	....	....	....	....	6	14	Pneumonia.
Harry Lee	....	....	14	....	1	2	....	....	....	.....
Thomas Whitaker	2	6	....	2	6	12	....	....	....	.....
Mary Ann Maher	....	....	26	....	4	10	....	....	....	.....
Walter Leonard	1	7	....	1	11	18	....	....	....	.....
Alma Petterson	....	....	13	....	....	....	....	....	17	Pneumonia.
Ada Call	....	1	....	....	....	....	....	9	....	Pulmonary tubercle.
John Chard	5	....	....	5	0	24	....	....	....	.....
Wm. H. Smith	....	....	28	....	....	....	....	3	....	Diphtheria.
Edward Dolan	....	11	....	....	....	....	....	....	....	.....
Frank Hallenbeck	....	1	12	....	....	....	....	9	6	Pneumonia, rubeola, etc.
Annie Miller	....	6	....	....	....	....	....	7	21	Pneumonia.
Margaret Morris	....	5	....	....	....	....	....	5	9	Diarrhœa.
Gustave Dury	....	1	19	....	....	....	....	8	....	Pulmonary tubercle and pneumonia.
James Haughery	1	9	....	2	....	....	....	....	....	.....
Henry Eastman	....	....	21	....	....	23	....	....	....	.....
Michael Clark	1	6	....	2	....	....	....	....	....	.....
Ellen M. Kellgren	....	1	....	....	....	....	....	1	19	Pneumonia, diarrhœa, etc.

ADMISSIONS TO THE NURSERY AND CHILD'S HOSPITAL (DEATHS KNOWN UNTIL NOV., 1871, ONLY). NOVEMBER, 1870.

Names.	Age at admission.			Age at discharge.			Age at death.			Diagnosis.
	Yrs.	Mos.	Days	Yrs.	Mos.	Days	Yrs.	Mos.	Days	
Carrie Wall	3	6	....	....	....	....	....	....	....	.....
William Bottomley	1	5	....	....	....	....	1	5	18	Pneumonia.
Ernestine Friend	1	8	....	2	....	....	....	....	....	.....
Lizzie Smith	....	6	....	....	....	....	....	....	....	.....
Moses Wertberger	7	....	....	7	8	....	....	....	....	.....
Carl Begert	1	8	....	....	....	....	....	....	....	.....
James McComb	1	9	....	1	10	3	....	....	....	.....
Eliza Kreutz	....	....	14	....	....	....	....	8	....	Diarrhœa.
Joseph Connors	2	7	....	2	7	3	....	....	....	.....
Emil Koenigberg	1	....	....	1	....	21	....	....	....	.....
Mary Smith	.	6	....	....	....	....	....	11	4	Atelectasis.
Matilda Lauffen	3	5	....	3	6	14	....	....	....	.....
Joseph Fletcher	3	6	....	....	....	....	....	....	....	.....
Annetie Schwan	3	6	....	3	7	....	....	....	....	.....
Mary Kreuse	....	....	13	....	....	....	....	11	....	Pertussis.
Jabo Besancon	....	9	....	....	....	....	....	9	25	Pneumonia.
Frederick Vogel	....	2	....	....	....	....	....	10	....	Chronic diarrhœa.
William Lee	....	2	....	....	2	24	....	....	....	.....
Augusta Funenberg	....	5	....	....	6	....	....	....	....	.....
Thomas Ramsbotham	1	10	....	2	5	....	....	....	....	.....
Albert Nellis	....	4	....	....	....	....	....	5	15	Broncho-pneumonia.
James Brady	....	3	....	....	....	....	....	5	18	Pneumonia.

CHILDREN WHO DIED BETWEEN OCT. 1ST, 1870, AND OCT. 1ST, 1871, BUT WERE ADMITTED PREVIOUS TO OCT. 1ST, 1870.

Names.	Age at Admission.			Age at Death.			Diagnosis.
	Yrs.	Mos.	Days	Yrs.	Mos.	Days	
Henry Bidere	....	....	21	....	2	....	Diarrhœa.
Ada Murphy	....	7	....	....	7	12	Tuberculosis.
Herbert Charles	....	2	6	....	7	18	Diarrhœa and pneumonia.
John J. Kelley	....	....	21	....	4	5	Pneumonia and cholera infantum.
Edward Walsh	1	....	....	1	1	14	Diarrhœa and pneumonia.
Sallie Kreunthall	....	....	29	....	8	12	Chronic Pneumonia.
Mary Murphy	....	....	21	1	....	24	Pneumonia.
John Read	....	1	15	....	9	19	Marasmus.
Helena Anderson	....	....	14	....	9	4	Pneumonia.
Michael Bracken	1	10	....	3	3	13	Rubeola and cancrum oris.
Mary Jackson	....	....	10	1	6	13	Rubeola.
Cornelius Lindsay	....	....	15	....	6	13	Diarrhœa and pneumonia.
Eugene Pady	....	....	....	....	2	10	Chronic diarrhœa.
Dehlia Kusick	....	....	18	....	4	....	Capillary bronchitis.
Sydney Rankin	....	....	14	....	4	17	Pneumonia.
Mary Kingsley	....	....	....	....	6	....	Entero-colitis.
Nellie Callaghan	1	2	16	1	6	....	Chronic diarrhœa.
Emma Myers	....	....	....	....	10	15	Diarrhœa and bronchitis.

institutions which have been so highly esteemed as these are found to be in so unsatisfactory a condition, it is discouraging to think how many serious abuses a strict scrutiny into the affairs of all our charitable institutions would be likely to reveal. There are many people who in the name of charity labor industriously for the attainment of selfish ends, and such persons seldom fail of enlisting the aid of well-meaning people in their plausible schemes. We fear that a thorough investigation into the affairs of all our charitable enterprises might bring to light many projects for self-aggrandizement at the expense of the generous and the poor. The subject is an unpleasant one, but none the less deserves the attention of those who are responsible for the honest and judicious expenditure of the vast sums annually contributed in this city for the benefit of the suffering and needy."

And now let us for a moment examine into the expenses of large institutions like the Nursery and Child's Hospital.

On page 12 of the "Seventeenth Annual Report of the Nursery and Child's Hospital in the City of New York, 51st street, corner of Lexington avenue, March 1st, 1871," under the heading of "Financial Report" you will find the expenses between March 1st, 1870, and March 1st, 1871, laid down at a little more than $75,000. Of these I deduct at once $30,000 for "temporary investment," "part purchase of Country Hospital," and "furnishing and support of Country Hospital." Balance, $45,000. As repairs and insurance are counted up with more than $4,000, I estimate the rent of the immense buildings at $20,000 only. Thus I take $65,000 as a fair, or rather low, average estimate of the whole sum spent for the benefit and support of 253 admitted children and 117 lying-in women with their infants. *They are the only beneficiaries,* for the mothers taken in with, or in behalf of, their nurslings, and the wet-nurses, cannot be counted in this class, any more than the matron, the ward nurses, or the domestics. It may be interesting to know at this point that of $45,000 the house inmates paid about $12,000, the treasuries of the State and other authorities $24,000, and private subscriptions and donations amounted to little more than $1,700. The balance was made up by the receipts of the great Charity Ball.

Those beneficiaries did not stay in the institution through

the whole year, but a very small part of it only. The aggregate stay of the new-born, who were soon discharged, amounts to 8 years; those 27 who died at the average ages of 2 months, 17 days, to 6 years; those 20 who remain after the close of the year (October, 1870, to October, 1871), to 8 years. The aggregate stay of the 128 children who were admitted and soon discharged, to 18 years; of the 125 who are dead or still alive, to 60 years. Total, 100 years. The aggregate stay of the pregnant women who were confined in the institution may be set down at 20 years. Thus $45,000 without rent, or $65,000 rent included, are spent on *a year's board* of 100 children (the new-born included) and 20 adults, said board averaging the sum of about $400, rent not included.

How nearly correct this estimate is we find corroborated by the fact that the sum of about $12,000 is credited as "house income" in this year's financial report. Our summing up would average a yearly board paid by the inmates of $100, or a monthly one of about $8, which is almost the very figure (a little less) of the average board paid to the institution by the inmates.

While we remind our readers of the fact that our figures cover the time from October, 1870, to 1871, and the report alluded to the time from March, 1870, to March, 1871, and that, therefore, trifling differences may be found, you will still find a few of the items in the expenses highly interesting.

The 120 annual boards required in round numbers: $25,000 for provisions; wages amounted to $4,000; stationery, printing, and collecting (of $1,195 "subscriptions," I suppose) to $625; wine, brandy, drugs, and surgical instruments, $1,800. After all, you discover that, *besides* subscriptions, donations, payments of inmates, and proceeds of Charity Ball, the treasuries of the people of the State of New York pay alone 30 per cent. more than the rate of sustaining the infants under the charge of the Commissioners of Charities and Correction, and you will, we hope, agree with us in our conclusion that the State, that society, can work at a cheaper rate and on a more uniform plan than the dozens of self-constituted authori-

ties. Altogether you will find that the total cost of sustaining the infants of the Nursery and Child's Hospital amounts to more than treble the expense of the Commissioners for the same purpose.[15] We wish we could say that their successes were double as to general care, good food, clean wards, and mortality. Unfortunately, the high standards of foods, wards, and mortality are undeniable.

Let, however, these figures suffice. He whom they have not yet convinced of the truth of our statement that large institutions, no matter what their means are, will destroy their infant inmates, may perhaps change his mind on still further investigation. At all events, it will prove a diffi-

[15] In the minutes of the meetings of the Commissioners of Charities and Correction we read the following:

Resolved, That the estimates of Doctor E. S. Dunster, Resident Physician of the Infant Hospital, under date of 20th May, 1872, and of William H. Stephens, Warden of Randall's Island Nurseries, under date of May 16th, 1872, be adopted by this Board as the fair and equitable estimate of the care and provision of infants, per week each, in the Infant Hospital; and the cost for maintenance and hospital care of each child over the age of eighteen months, *per year,* in the Nursery for Children on Randall's Island; and that certificates of such estimates, signed by the Secretary of this Board, be transmitted to the Trustees of the Foundling Asylum of the Sisters of Charity in the City of New York, and to the Trustees of the New York Infant Asylum, as provided by chapters 635 and 263 of the Laws of 1872. August 2d, 1871. Adopted.

DEPARTMENT OF PUBLIC CHARITIES AND CORRECTION,
August 2d, 1872.

In conformity with the resolution adopted this day by the Board of Commissioners of Public Charities and Correction, and herewith transmitted:

I hereby certify that the sum of one dollar and seventy-two and one-tenth cents ($1.72 1-10) is a fair and equitable estimate for the care and provision of infants, *per week* each, in the Infant Hospital, and the sum of seventy-nine dollars and fifty-one and eight-tenth cents ($79.51 8-10) as the cost for maintenance and hospital care for each child over the age of eighteen months, *per year,* in the Nursery for Children on Randall's Island.

JOSHUA PHILIPS, *Sec'y.*

cult task to trace the fearful mortality of the institution we have spoken of to radical faults in the manner in which it is conducted. We do not think there are many shortcomings in the administration of that institution which will not be found in all carried on upon the faulty principle of accumulating large numbers of infants under one roof. Still, it must be said that institutions under dozens of managers labor under unusual difficulties—never thrive well. There is always something meddlesome, fidgety, inconsistent, incongruous, in large numbers; nor is the transaction of business by a ring, if we are well informed, cheap or expedient; nor can we presume that where less special knowledge than ambition and theoretical love is brought to bear upon a serious task like that of conducting an infant asylum, the results are surprisingly favorable. We say, "theoretical love"; for, where a board of several dozens of managers in New York City cannot command more than seventeen hundred dollars' worth of "subscriptions and donations," we dare say that love requires more practical illustration.

Old Homer says that a government of many heads does no good. He wants one master. Perhaps he thought of infant asylums. The improvements effected in the management and mortality of the Infant Hospital (Randall's Island) by the intelligent administration of a single medical officer with his subordinates, under the control and in the pay of the Commissioners of Public Charities and Correction, speak for the advantages of special knowledge and a uniform plan.

Let us then again urge the fact that large infant asylums will destroy children.

When this fact became known, many experiments were made of distributing infants over a number of places—the so-called cottage system. Six, ten, twelve, were kept in a small separate institution. The disadvantages are plain. The increased number of households raises the expenses, the difficulty of obtaining wet-nurses increases, control and medical attendance become more and more difficult. The cottage is, in fact, not much, if at all, better than a ward in a public institution.

What, then, is left but to board out the infants in the country? For common sense, hygienic principles, and statistics point to the country as the residence of the children of the commonwealth. When this conclusion will be the conviction of all, the necessary steps will be taken, no matter how great the difficulties may be. With us they are not small.

Our population adjoining the great cities, especially New York, is not so large as in Europe, and is not so poor. It is not of such vital importance for a country family to avail themselves of a small subsidy paid for the infant boarder. But there are some considerations which are to be taken into account. The first is that the infants we have to care for do not count by six or ten thousand

	Total number.	This year's increase.	With strangers.	Died.	With their mothers or grandmothers.	Died.
1860-61	10,987	1,931	4,124	263	6,863	778
1861-62	11,290	2,164	4,357	287	6,933	876
1862	11,737	2,513	4,706	292	7,031	983
1863	12,292	3,068	5,135	287	7,157	1,117
1864	12,980	3,736	5,815	251	7,165	1,188
1865	13,967	4,040	6,119	186	7,848	1,228
1866	14,490	4,293	6,272	187	8,218	1,111
1867	14,967	4,539	6,418	170	8,549	1,123

every year; and the second, that the sum which is at present spent for every infant under the charge of the Commissioners of Charities is by no means a trifle, and, under the managers of the Nursery and Child's Hospital, enormous. It would be found, on trying, that the apparent difficulties in procuring proper country homes for our infants would by no means be so great as they may appear at first sight. Even if there were some in the beginning, we should always gain, even by small results.

The question whether it would be desirable to leave, if possible, the young illegitimate child in charge of its mother, cannot be answered in a manner uniformly adapted to every case. The facts exhibited by the Munich records, according to which the children reared by their

own mothers have a fearfully larger mortality than those entrusted to strangers, do not look encouraging. In our city I am afraid that many of our unmarried mothers would not prove excellent nurses. Still, the fact of their being sufficiently supported might change the circumstances and yield better results than the following lists, comprising the numbers of all the infants and children up to fourteen years, in Munich, under official charge. Part of them are given in charge to parties under constant supervision of the proper officers. Part are in the care of their (illegitimate) mothers or grandmothers.

Thus the mortality of illegitimate children, in percentage, up to the fourteenth year, the surviving being counted again in every consecutive year, is the following:

	With mothers and grandmothers.	With strangers	Total.
	Per cent.	Per cent.	Per cent.
1860	11	6	9
1861	12.5	6.4	10
1862	14	6	11
1863	15.6	5.6	11.4
1864	16.6	4.3	11
1865	15.6	3	10
1866	13.4	3	8.9
1867	13	3	8.9

Thus the mortality of illegitimate children in Munich, from the day of their birth to their fourteenth year, is three times as large when they are left in the care of their mothers and relatives as when they are given in charge of strangers and remain under official supervision.

There is another consideration not to be lost sight of. Unfavorable though all circumstances be within the walls of an institution, mortality can be reduced by procuring paid wet-nurses for the same. We know that our nursed infants thrive much better than the bottle-fed. But no breast milk is obtained except from those who have no home, the poorest and most miserable. No married woman, as a rule, at least none who has the slightest means of escaping the discipline of and submission to institution

rules, will ever consent to become a wet-nurse to any of our children. Thus we have to take either the sickly or profligate, the very poor, or consider ourselves very fortunate when we succeed in securing the own mother's breast for the support of the infant. Many mothers, however, who have a home in the country, have lost a young baby, or have milk enough left, after weaning, to nurse, or enough to nurse two, but who would never consent to leave their husbands and children, could be induced to take charge of an infant. A careful comparison of the direct expenses of the two modes of rearing infants, out of and in asylums, in Europe, has proved that even there no pecuniary loss is incurred by the more advantageous and humane proceeding.

Besides, the nurses necessary for the infants in institutions are just so many nurses kept out of the service of the general public. In New York City wet-nurses are scarce since the humane efforts of the Commissioners of Charities and the Catholic Foundling Institution have been directed to the task of supplying our foundlings with human milk. Thus it is very probable that what society gains on one side, in the saving of the destitute and poor, is lost among the public in general. At all events, such element of proper food as is accessible at its own home only—that is, breast milk of the country-women—is left unavailable and unused.

If not absolutely necessary, no attempts at obtaining breast milk ought to be made within the limits of the city. Beside the other damaging influences of city life and city atmosphere, which alone destroys so many infants' lives, the experience of former times, of boarding the city's infants within the boundaries of the city, has been very unfavorable.

It is not our intention to go into the particulars of administration at this moment. Still, we beg the privilege of pointing out a mode of action which in some parts may prove faulty, but which, under our circumstances, will, in our opinion, prove sufficiently correct to enlist sympathy or bring out a discussion.

Before so doing we again refer to our opinion on the

responsibilities and duties and the rights of the State. The whole administration of the foundlings ought to be controlled by the commonwealth. Private or sectarian establishments ought to be under governmental supervision; ought not to be supported or aided by the State, but not interfered with so long as their successes and general management appear satisfactory; the department of the foundlings to be centered in one office, the necessary appointments of the head or heads to be made by the Governor of the State.

The expense of boarding the foundlings to be borne by the people of the State of New York.

By concentrating the administration the running expenses would be but small in proportion. New York City would have a single depot for the abandoned children, from which speedy distributions would take place. The large buildings at present dedicated to the purpose of raising infants would soon be required for those children who would be returned from the country after reaching the age of three or five years. Some might become hospitals—we have no child's hospital in New York City—some schools and asylums for the older children of the community, where they would be taught to become useful citizens of the Republic.

We assume a mortality in the first year, say, of 25 or 30 per cent. of infants abandoned in the first year. After that time the mortality will become small. Of 1,000 abandoned infants 750 or 700 must reach in future their twelfth month. We assume $150, the amount spent by the Commissioners of Charities and Correction, to be a fair average for yearly board, clothing, etc. Thus 1,000 abandoned infants would cost the State per annum, say, $120,000. The 3,000 lives endangered or thrown away every year might cost us $350,000 yearly; but then we should certainly succeed in saving most of them, at a proportionately small expense, and educating those many who have been saved.

The question concerning the best mode of disposing of the children who have reached their sixth year, or the end of their sixth year, must be answered on the strength

of the following considerations: The mortality of early age has closed by this time, it being ten times less between the sixth and fourteenth years than what it has been from birth to the sixth year. Therefore, there is but little danger in recalling the children from their temporary homes in the country. Experience has taught, and statistics prove, that mortality in public institutions in that period of life is not large. The reasons are evident. The children are active, their occupation is divided between playing, learning, and light work. They are changing about between the playgrounds, dining-rooms, schoolrooms, workrooms, and bedrooms. Ventilation, therefore, and a full supply of air rendered easy. Thus not even the customary requirements of a certain number of cubic feet per head will hold good for institutions of that kind, less space being necessary than in hospitals. Thus there is no doubt that the children of that age may be removed from the country to be transferred to their common city homes.

But there is more than the mere admissibility of uniting the children in an institution, refuge, or orphan asylum. It appears that such a step is advisable and may become necessary. At the age we speak of the child requires further education and schooling, unless the sad results of neglected education, such as we have spoken of in regard to the French foundlings, are expected to be encountered in later life. The infant and young child had everything it needed in the pure atmosphere of the country, and at the breast or cow's milk diet. But schooling cannot be supplied at will, and even this will does not always exist. Even in the immediate neighborhood of large cities school education is neglected with a part of the population, and, as it is not compulsory with us, it is more than probable that in very many cases of our foundlings it would be neglected. Moreover, that very period of life is the one in which the children may be made useful for work adapted or not to their age. There is some reason to fear that the children entrusted to the care of strangers would sometimes be overworked and become unhealthy and crippled. Thus the results of the former years' care and attention

might in many cases be endangered again by the carelessness or avariciousness of the parties concerned. The temptation, it must be feared, would be too great for them in some instances.

Thus it appears that while the earliest period of life requires farming-out to private parties in the country, the more advanced age might be more benefited by education in larger institutions. The mode of their management may differ in many respects. There may be a difference of opinion regarding the choice of small or large institutions. Some are in favor of uniting a limited number of children under the superintendence of a teacher who at the same time is the superior of the common household. This much is certain, that whatever plan is followed concerning the education of children after their sixth year, the recalling them from country homes ought to be considered as preferable to their remaining in their seclusion, whenever there is a possibility of occasional neglect. Experience will show whether such neglect is to be feared, however. Mr. Anderson's results speak certainly in favor of allowing the children to remain in their country homes; and Samuel B. Howe, in an address delivered at the ceremony of laying the corner stone of the New York State Institution for the Blind, September, 1866, when speaking of the comparative value of large institutions and private homes (not for the blind only), says: "All great establishments in the nature of boarding schools, where the sexes must be separated; where there must be boarding in common and sleeping in congregate dormitories; where there must be routine and formality, and restraint and repression of individuality; where the charms and refining influences of the true family relation cannot be had—all such institutions are unnatural, undesirable, and very liable to abuse. We should have as few of them as is possible, and those few should be kept as small as possible. . . . We should be cautious about establishing artificial communities, or those approaching them in character, for any children and youth."

But "when two do the same, it is not the same," and, therefore, we are not prepared to recommend a uniform

rule and advice in every individual case. The character of the foster-parents, the distance from the nearest schoolhouse, etc., are just as many points requiring consideration.

CONCLUSIONS

In accordance with the facts and conclusions contained in this report, which we have the honor of presenting to the Medical Society of the State of New York, we desire to propose the following:

That the life and health of every infant are, both economically and morally, of paramount importance to society and to the commonwealth.

That it is the duty of society and of the State to grant every infant the possibility of living and obtaining an education.

That it can under no circumstances free itself of its responsibilities by throwing them upon private individuals, but should take charge of every infant deprived of its parental protectors by death or incompetency.

That science and experience have united on certain principles to be observed in the raising of the young.

That human breast milk is more appropriate than artificial food; the country more wholesome than a large city; and an inferior private dwelling better adapted than a large, overcrowded institution to the raising of an infant.

That the practice of uniting lying-in asylums with infant asylums or hospitals is a direct source of dangerous disease and fearful mortality.

That the accumulation of many infants under one roof, under the best possible circumstances, and with as gentle care as is observed in New York State and City, is conducive to ill-health and unavoidable mortality; this system having been given up in Europe for this very reason.

That, according to the statistics of our own large infant asylums, especially the Infant Hospital, under the charge of the Commissioners of Public Charities and Correction; the Catholic Foundling Asylum, under the charge of the Sisters of Charity; and the Nursery and Child's Hospital, under the charge of a board of lady managers—all in

New York City—their infant mortality is immense, and equal to the mortality of the large foundling hospitals of Europe before a radical change in their system of management was instituted.

That the necessity of distributing abandoned infants among private families, especially in the country, is urgent.

That the Medical Society of this State recommend such a change in the method of caring for abandoned infants.

That the State should see that this change be made as speedily and fully as possible by all the public and self-constituted authorities concerned in the care of foundlings; inasmuch as it has positive responsibilities toward every member of society in general, and the young and feeble in particular.

That, however, the State should not interfere with private charity toward foundlings so long as the interests of the infants and the commonwealth are not injured.

That the State ought not to be held responsible for expenditures not incurred by itself nor under its own control; that private charitable societies should not assume duties beyond their own means; and, particularly, that while private charity and enterprise must be encouraged, private ambition and officiousness must not be indulged in at the expense of the taxpayers.

That, therefore, when private individuals or corporations ask the commonwealth for permission to administer charity on a large scale under the rules and regulations of a charter, this permission and charter does not involve that the State should be tributary to such individuals or corporations.

That, as medical men and citizens of the Republic, we are of the opinion that the maintenance of large institutions for the care of foundlings, by the payment to them by the State of eight dollars per head per month, is not productive of good results.

That the probability or possibility of frequent changes in the administration of such institutions, which are, moreover, liable to be placed under the charge of persons whose

qualifications for the solution of questions of the greatest difficulty and importance are frequently doubtful, is a source of great danger to both the infants and to the commonwealth.

That the supervision and control of all the abandoned infants of the State belong alone to the State, no matter whether they are sustained by the State or by private individuals or corporations.

That we see in such supervision and control no unrepublican centralization, but the performance of a duty of the commonwealth toward the feeble and dependent young.

THE IMPROVEMENT OF THE POOR AND SICK CHILDREN: GENERAL PRINCIPLES

A Letter to the Honorable the Board of Trustees of the Thomas Wilson Sanitarium for Children.

GENTLEMEN: You favored me with a note dated Baltimore, December 8, 1879, in which you honored me with the request to write an essay on the best method of establishing a sanitarium (not a hospital, but a summer retreat) for sick children. At the same time you also desired my opinion regarding the regulations suitable for receiving and administering medically and otherwise to those who would be the proper objects of your care, with such suggestions as might occur to me in reference to the character of the buildings that might be requisite, their grouping, or isolation; how best to provide for mothers or nurses accompanying their children; and generally such incidental recommendations as experience and reflection might commend as valuable and useful.

You also wish my suggestions in reference to the most practicable means of lessening the risks and changes incident to children exposed to the heated and impure atmosphere of a large city during the summer months; also my views as to the best methods of extending a general knowledge of simple hygienic rules for the treatment of children at home among the poorer classes. And while you express your hope, "at least, to show a model of experiment," which may prove of value as a contribution to the best means of lessening the mortality and promoting the welfare of young children in Baltimore, and in other large cities, you direct me to give my thoughts in the method and manner which I shall deem most conducive to their successful presentation.

All these questions and demands I look upon as in perfect harmony with the objects of your corporation, when first established. For though a summer retreat was mainly contemplated by the originator of your vast plan of benevolence, the general object was to "alleviate pains and to prolong life." And while a summer retreat for sick children was mentioned as the one prominent end to be reached, other kindred purposes, as might be hereafter determined upon by the corporation, were included in the points to be gained.

Thus, the original intention of Thomas Wilson, and your specifications, questions, and demands, comprehend a vast amount of important matter. Not only do you ask for the best means of extending the knowledge of simple hygienic rules for the nursing and treatment of children,—which are the same for those of the rich and the poor, white and black, Christian, Gentile, and Infidel,—but you desire to provide for those who are well, so as to protect them from sickness; for the sick, to cure them; for those in particular, who suffer from impure air and heat, so as to save them; and also ask for plans and specifications. While I express my fear that I may not be able to say anything new, and my doubt whether I can do justice to the subject as understood by you, I am gratified, at least, by the fact that you do not expect to correct a great universal evil by a single remedy or by a single method. Benevolent efforts avail but little, as a general thing, because they are directed against special evils, which are either the outgrowth of a false system or but a link in a chain. The breadth of your views includes the desire to benefit the poor children, be they well or sick,—as they are almost certain to be, because they are young; and more so because they are poor. The latitude, however, extended by you to the expression of my views, renders my task very difficult; because, to do it justice, extensive discussion upon the hygiene and diet of infants and children, the physiology of their digestive and other systems, the influence of heat on their nerves and blood, and upon the condition of their food, the essential points in their diseases, and the rates and reasons of their mortality, might be expected. Fortunately, the main principles of many of

these points are settled; and therefore my remarks can, in part, be fragmentary. There are a number of truths which, by this time, are considered self-evident; and strictly scientific questions, which are still undecided, do not belong here.

The class of people to be benefited by your corporation are the poor and sick children. The main attention is to be paid, however, to the children threatened by, or suffering from, the heat of the summer and impure air, both of which not only affect the nervous system directly, but destroy life by acute or chronic affections of the alimentary canal.

To what class and age do they belong? And is it mainly the heat, or mainly the impure air, or mainly the food, which destroys them? Which of these factors is most objectionable and preventable? And are there no other factors of excessive infant mortality which can be obviated?

Of 100 newly-born babies, 16 or 18 will die before they are a year old in most countries. In England, of 100 born to the gentry, there lived after a year, 90; tradesmen, 79; working class, 68.

Of 1000 dead in the first families in Germany, 57 were under five years of age; amongst the poor of the capital there were 345.

In the starvation years of 1841 to 1851, the population of Ireland decreased by 19.8 per cent., the number of children under five years by 37 per cent.

The average mortality of the new-born in France up to the completion of their first twelve months is 16 per cent.; in four of the districts to which infants of Paris are sent for nursing purposes, it was 25.63, 30.28, 27.62, 51.33 per cent., while the mortality of babies born in these very same districts, and less neglected by the women, was less frightful.

Of Paris babies sent to the country for nursing and rearing purposes, and strictly superintended by the proper authorities, 17 per cent. died before the end of the first year,—that is, but one per cent. beyond the average mortality of that age in France. Of the babies sent out by private societies, with the same pay and regulations, not

officially watched, however, 42 per cent. died. The foundlings of the Departement Eure et Loire, who were bottle fed, and in many instances a number of them in charge of a single woman, from 60 to 75 per cent. were destroyed before they reached the end of their first year; many of them never had their faces lit by a smile. Of 1000 children in France, an average of 554 reached their tenth year; of 1000 French "assisted children," but 271. That babies at the breast suffer less, and fewer die, than those raised on artificial food, is a commonplace experience and statistical fact which need not be insisted upon any further. That the nature of the artificial food,—a single meal of sour milk, or indigestible farinacea,—swells the lists of deaths, is well known.

It was mainly the injurious feeding which, with the overcrowding, resulted in the heart-sickening rates of mortality amongst the population of the Prague foundling asylum. It was 82.97 per cent. in 1857; 90.46 in 1858; 87.07 in 1859; 86.95 in 1860; 89.71 in 1861; 88.79 in 1862; 93.19 in 1863; 72.52 in 1864; 62.46 in 1865; 60.14 in 1866; 54.07 in 1867; 46.68 in 1868; 46.08 in 1869.[1]

Lessened mortality of the infant under a year depends to a great extent on favorable external circumstances, sufficient food and its appropriate selection. When Ménier insists upon the rate of mortality depending upon the intellectual culture of the people, he forgets, in behalf of his bright saying, that intellectual culture and abject poverty do not go hand in hand, but that the former requires the foundation of physical comfort and ease.

Of 100 deaths taking place in the total population of Europe, 26.5 per cent. were under a year; 5.6 from 1 to 2; 2.6 from 2 to 3; 1.8 from 3 to 4; and 1.35 from 4 to 5 years old.

Such is the average of all classes in all seasons.

Of 2,216 infants who died under a year in Baltimore during 1875, the number of those who died in June, July, and August was 984, equal to 44.5 per cent., instead of 25. Of 705 who died between their first and the end of the

[1] See article on "Foundlings and Foundling Institutions," on page 217 this volume.

second year, there were in the same months 200, equal to 29 per cent., instead of 25. Of 508 between the second and fifth years, 110. Thus the months of June, July and August proved very murderous to the population of infants under a year, to a certain extent so for those between the first and second years. Those between the second and fifth years were rather safe from the influences which destroyed the very young infants. *Their* main mortality was in the first quarter of the year 202 out of 508, a fact the repetition of which in almost every year directs the attention of every student to those causes of sickness and death which are apt to develop in the colder season,—that is the period of closed doors and windows, and epidemic influences.

Of 2317 infants, of less than a year, who died in Baltimore in 1876, the same quarter, namely, June, July, and August, took off 53 per cent. of the whole number, instead of 25. Of 2182 in 1877, 48.3 per cent; of 1834 in 1878, 40 per cent.

Of 925 children of more than a year and less than two years, who died in 1876, the same quarter took off 33 per cent. of that number; in 1877, 35.3 per cent. of 1329; in 1878, 29 per cent. of 604, instead of 25 per cent.

Of 398 children of more than two and less than five years, who died in Baltimore in the whole year 1876, the same quarter of the year destroyed 18 per cent.; in 1877, 23.6 per cent. out of 578; in 1878, 24 per cent. of 444.

The months of June, July, and August, with their high temperatures and diarrhœal diseases, with all their consequences, destroy large percentages of the babies under two years of age, mainly those of less than one year, while the greatest mortality of the children of from two to five years depends on other causes, and takes place in other seasons.

Of a total mortality of 4070 in the city of New York, in the four weeks ending on July 17, 1880, there were 1962 infants under one year; under two years, 2451 (1st to 2d years, 489); under five years, 2641 (2d to 5th years, 190). In these four summer weeks the mortality of infants under a year amounted to 48.2 per cent.; under two years 60 per cent.; under five, 64 per cent. of the total mortality.

The mortality of babies under a year was about equal to the total average mortality for the whole year of all diseases under ten years.

The statistical proofs, which might be accumulated indefinitely, show only what we know too well, that the heat of the summer destroys life in uncommon numbers, and mostly where the air is not only hot, but also impure. And they prove also that it is mainly the infants under two years who suffer from the effects of the season, through its influence on the alimentary canal. It is mainly those in their first year who are liable to be affected by digestive disorders, while those in the second are more decimated by respiratory diseases; this is contrary to the prevailing impression, which attributes the majority of digestive disorders to the second year, and mainly the second summer. This belief is an incorrect one, and not founded on facts. The second summer is in itself not more dangerous than the first, on the contrary; for morbility and mortality decrease from day to day after birth. The youngest is the most liable to fall sick and die, and mortality decreases with every day, week, and month. It is not the second summer which kills the baby, it is after the child has been weaned, the sour cow's milk, the ice-water, the candy, the green apple, the short socks, the partaking of all, as mothers will proudly state, "that is on the table."

The mistakes in the diet of young children and its injurious effects are the results of both the ignorance on the part of the mothers as to what constitutes a proper nourishment, and the difficulty of obtaining it either fresh or unadulterated. Ignorance cannot be cured at once; in regard, however, to the feasibility of supplying the poor infants of a large community with wholesome, fresh, and unadulterated food, I desire to make a practical proposition.

Again I insist upon the fact that the part of the population which is subject more than any other to acute disease and chronic ailment, consequent upon improper feeding, is below two years of age; that at that age mortality is greatest, and depends mainly upon diseases of the alimentary canal. It is therefore the food required for the

first two or three years for which my suggestions are meant. Now, infants' and children's food has a peculiarity which renders a sufficient and wholesome supply very easy to obtain. They require no variation, no stimulants, under ordinary circumstances, and with the exceptions to which I shall have to allude, no spice, no mixture. Day after day, month after month, the baby takes the breast, sucks the bottle; the child takes his plain food, the same every morning, noon, and night, without longing for a change, refusing it, even, and, thriving, gains weight and spirits. Thus the bill of fare for babies and children is a very simple and short one, easily obtainable, and, as a rule, easily procured but for the heartlessness of trade. And this very heartlessness of trade, the recklessness with which the consequences of deception, as far as the health of the community in general, and of the little children in particular, is concerned, are disregarded, is the reason why I desire that some means should be found through which an adequate supply of wholesome food could be placed within the reach of every infant and young child of the poor classes.

The safest food for an infant is the breast milk of either its mother or wet-nurse. The latter is out of the question amongst the babies of the poor. Where no breast milk can be had, or the supply is insufficient, substitutes must take its place. As soon as weaning becomes a necessity, that is, under ordinary circumstances, after a few teeth have made their appearance, artificial feeding has to take the place of the natural supply. The articles of food remain the same for a long time, no change being required except as far as a gradual increase in the consistency of the meal is concerned.

What this nourishment should be I have mentioned in my work on "Infant Diet,"[2] and in my essay on "Infant Hygiene," in the first volume of the "Handbook of Hygiene," edited by Dr. A. H. Buck.[3] The rules I laid down in these publications are the result of no mere theoretical combinations, but the outgrowth of my experience through

[2] First ed., 1872; Second ed., 1875. [3] New York, 1879.

a quarter of a century, and are borne out by chemical facts and the teachings of infant physiology. In the hands of the Board of Health of the city of New York, by whom they have been extensively published and distributed in the beginning of every summer, for the last seven years, they are known to have done much good; they have certainly done so in my practice.

They read as follows, with the judicious official additions mainly under III.:

RULES FOR CARE OF INFANTS

HEALTH DEPARTMENT,
No. 301 Mott Street, New York.

At a meeting of the Board of Health, held June 3, 1873, the following series of rules (approved by many physicians) for the management of children during the hot season, with a view to prevent the large annual mortality of this class, was submitted by the Sanitary Committee, and ordered to be printed:

I. NURSING OF INFANTS

Over-feeding does more harm than anything else; nurse an infant a month or two old, every two or three hours.

Nurse an infant of six months and over, five times in twenty-four hours, and no more.

If an infant is thirsty, give it pure water, or barley water, no sugar.

On the hottest days a few drops of whiskey may be added to either water or food; the whiskey not to exceed a teaspoonful in twenty-four hours.

II. FEEDING OF INFANTS

Boil a teaspoonful of powdered barley (ground in coffee-grinder) and a gill of water, with a little salt, for fifteen minutes; strain, then mix it with half as much boiled milk, add a lump of sugar, size of a walnut, and give it lukewarm, from a nursing bottle. Keep the bottle and mouth-piece in a bowl of water when not in use, to which a little soda may be added.

For infants five or six months old, give half barley-water and half boiled milk, with salt and a lump of sugar.

For older infants, give more milk than barley-water.

For infants very costive, give oatmeal instead of barley. Cook and strain as before. When your breast-milk is only half enough, change off between the breast-milk and this prepared food.

In hot weather if blue litmus-paper, applied to the food, turns red, the food is too acid, and you must make a fresh mess, or add a small pinch of baking-soda. Infants of six months may have beef-tea or beef-soup once a day, by itself, or mixed with other food; and when ten or twelve months old, a crust of bread and a piece of rare beef to suck.

No child under two years of age ought to eat at your table.

Give no candies, in fact, nothing that is not contained in these rules, without a doctor's orders.

III. Summer Complaint

It comes from over-feeding and hot and foul air. Keep doors and windows open.

Wash your well children with cool water twice a day, or oftener in the hot season.

Never neglect looseness of the bowels in an infant; consult the family or dispensary physician at once, and he will give you rules about what it should take and how it should be nursed. Keep your rooms as cool as possible, have them well ventilated, and do not allow any bad smell to come from sinks, privies, garbage boxes, or gutters about the house where you live. See that your own apartments are right, and complain to the Board of Health, 301 Mott Street, if the neighborhood is offensive. Where an infant is cross and irritable in the hot weather, a trip on the water will do it a great deal of good (ferry-boat or steamboat), and may prevent cholera infantum.

By order of the Board,

Chas. F. Chandler, *President.*

Emmons Clark, *Secretary.*

The object then, is to place a full supply of infant food within the reach of every infant or young child. The articles are:

Powdered barley, or powdered oatmeal, sugar, milk, eggs (for children of about a year and over), in about the following quantities:

Powdered barley, a package of a half pound for a child under a year, every week. Two such packages for a child from one to two years of age. When oatmeal is required, the latter in place of barley.

Eggs, seven a week for a baby a year old, or less; fourteen a week for a child over a year old.

Sugar, a half-pound a week.

Milk, twelve ounces to a baby under a year, twice a day; twenty ounces to those over a year, twice a day.

In regard to milk only, there is a difficulty; adulterations can be avoided by watching and examining, but the influence of heat on cow's milk is such that it is hard to avoid; during the hot days there is danger of acidity and fermentation. Cow's milk, when leaving the udder, is but rarely alkaline at the best; the transformation of its milk sugar into lactic acid takes place very rapidly, and a single failure in procuring sweet and proper milk may be the cause of disease and death.

As this is so, while the frightful mortality from improper food is explained easily enough, the efforts to avoid it must be permanent and persistent.

I propose that your body should have and superintend a place or places in the city of Baltimore, where the infants and young children of the poor class can purchase the simple, though sufficient and ample articles of food. If there be an expense to be risked for your fund at all, it would be for rent and saleswomen. But this expense may as well be borne by the purchaser, for I do not propose that the whole populations should be a receiver of alms. From a humane and an economical point of view only, I insist that the poor should be enabled to buy, in absolutely good quality and at a fair price, the necessaries of life and health. It is they who are more liable to be deceived as

to quality and price in all they buy, therefore they ought to be protected. Thus, whatever the infant requires in the way of food ought to be bought by those who are responsible for it, at a fair price,—be the responsible party the working man who supplies his family, or society who sustains its members not provided with family support.

Your stock of cow's milk during the summer must be large enough for your summer sanitarium. One good cow will supply the milk for five babies and five children over a year old. It can, however, be kept at any figure high enough to yield a full supply of good milk transported to the city twice daily, for all those infants and children coming under the provisions of this arrangement. If all the milk you sell to the infants and children in Baltimore comes from your own farm, you are sure of the article you sell, provided you know that your cans are always cleaned and washed out with soda solution, and your help always trustworthy. In case you have to purchase milk, you require additional watching. While admixture of water alone does not harm milk except by diminishing its relative value both as merchandise and nutriment, it is still a deception to be guarded against, and admixtures and adulterations will always require the application of proper tests.

Though I expect that fresh milk would be supplied twice daily, souring may take place so rapidly that I think proper to guard against it, at all events in the hot summer months. I recommend that the milk be not sold in its raw condition, but boiled at once. Without going into the chemical and physical reasons for that step, I simply refer to the unmistakable fact that boiled milk keeps better than raw milk. Yet another step may be taken in the same direction. I propose that an addition of bicarbonate of sodium be made to the milk sold by you for infant food in the proportion of one in a thousand. This small quantity will retard the souring of milk somewhat, and the addition of the sodium salt to cow's milk, and its farinaceous admixture (with its superior amount of potassium) renders the milk sold by you a little more similar to mother's milk in regard to the chemical constituents of its salts.

Barley, oatmeal, and sugar are to be sold in ready-made packages.

This sale of food ought to be a permanent affair, and not limited to the summer months only; for though the influence of summer heat is certainly most detrimental, in connection with improper feeding, this alone, at any time, is the main injury to infants and young children, endangering their whole future life. Mortality is great from diseases of the alimentary canal in winter as well; and though they are not fatal to the same extent or number, the amount of permanent harm done to the digestive organs, lymphatic glands, and powers of assimilation after apparent or partial recoveries can be judged only from the large class of dyspeptics and prematurely decrepit persons, both physically and mentally, who owe their ailments to chronic or acute abdominal disorders of their early years.

The persons to whom the sale could be trusted would be best selected from such help in your summer sanitarium as you would care to give permanent employment to, because of their intelligence and usefulness. The localities would be either a small store or stores, rented for the purpose, or a part of a store in a convenient part or parts of the city, be they groceries, or apothecary shops, or a part of, or a place adjacent to, a dispensary building.

Persons applying and being regularly supplied from your stores ought to be known as deserving the privilege. Those who have been inmates of the sanitarium during a season would be recognized at once as entitled to being served. The poor, who are attended in dispensaries, can easily prove it. Such, however, as have not required medical treatment for some time can soon prove their claim by a note from some neighbor, or a physician. At all events, care should be taken lest that part of the population who, under the present arrangements of society, must be expected to pay a certain legitimate percentage of profit to the class of traders, should not avail themselves of undue advantages by crowding your legitimate customers out of their rights and privileges. The well-to-do and rich have more facilities in guarding against being deceived and over-

reached, than those in whose favor you are called upon to interfere. At all events, the well-to-do and the rich will gather an advantage from your efforts which everyone will have a reason to rejoice over. It depends upon the certainty that a public sale of the simplest food for infants and young children, which at the same time is the very best, will always constitute a powerful admonition and instruction to the whole community. The facts that infants and children do not only bear, but that they require, absolutely plain, simple, wholesome, digestible, nutrient food only, only, only! cannot be repeated too often. Let your practical teaching be a warning and a blessing by the information extended to the public at large; that the few articles you sell to the poor are those which are also best adapted to the rich, and the only ones you recommend for the food of the infant and the young child of both poor and rich. Nature is too republican in spirit, too democratic in character, to bow to differences of social standing.

In this connection I again insist upon a fact which appears to be so self-evident as not to deserve mention. And still with the utmost pertinacity the public insist upon giving their children, as soon as weaning time arrives, or before that period, such articles of food as they know nothing about. When an adult sits down to a table, he or she will inquire about a strange article of food with which he was not acquainted before. The baby, however, is credulously fed upon things which neither baby, nor father or mother, nor doctor is in the least informed about. I speak of the baby foods in the market, and in general use. Most of these foods, which are sold in large quantities, have compositions which are not known. When the manufacturer deigns to say anything about his merchandise, he assures you that it is the best in the market; that it is the proper thing, the only proper thing, for children and invalids of all ages; that the relation of albuminous substances to carbon hydrates is exactly correct, and that a package costs a certain amount of money. In regard to this subject the public appear to be smitten with absolute blindness. They insist upon forgetting that the man who offers for sale,

and advertises at a heavy expense, any article of merchandise, does so—as society is constituted—for his pecuniary advantage solely. To say that when his article is not good it will find no market is deceiving yourself, experimenting on your baby, relying on the character of a single man, or a corporation, on the honesty or intelligence of his chemist, or his superintendent, or his workmen, on the nature and condition of the elements offered for sale, and on a great many influences, which can be at work before the manufactured articles get into the hands of the consumer. Why the sellers and advertisers of unknown compounds should be trusted more than those who raise and sell a simple article of food, such as milk, which is constantly adulterated, can hardly be perceived. Is it necessary to say that the factory furnace works more in the interest of the proprietor than for the benefit of the public, and that the examination of many of the foods for sale in different packages and in different years yielded different chemical and physical results?

Meanwhile, it is a fact that no better food can be procured than what nature offers with a willing hand, for little work, at a trifling expense. There is no food on which infants and children of all classes thrive better, thrive so well, as the few articles the sale of which, in the manner described, is recommended to you. In this respect at least, and at this early age, there is equality amongst members of society.

Therefore, no patented article of food should ever be sold by you. If, in the Summer Home of the Brooklyn (L. I.) Children's Aid Society, they allow every child to continue, and every outside practitioner to indicate, its artificial food, it is simply a grave mistake, which will certainly be remedied as soon as understood to exist.

Nor do I see that anything could be added to your stock, with the exception of brandy. The influence of the summer heat is not only destructive by the influence it has on food, but also, and mainly, by its debilitating effect on the nervous system. It is a physiological fact, always observed and firmly founded on experimental science, that the nervous system of little babies is easily overthrown by two en-

tirely different conditions, both of which are equally dangerous. The nervous system of the newly-born is rather torpid and dull in its action, there is very little nervous function; particularly the sensitive portion is but poorly developed. This condition depends on the crude and undeveloped state of the brain and nervous system, from an anatomical point of view. The nervous system of the baby is not yet fully differentiated into its later constituents; it is not mature. Thus a slight influence from outside may blow out the light which is burning but dimly. On the contrary, after a number of months, the sensitiveness of the rapidly developing baby's brain and nervous system is so great, while the equilibrium between the several constituents is not yet established, that a slight disturbance will result in irregular reflexes, convulsive movements, and death.

The influence of heat exhausts not only the action of the great nerve centres, but also the peripheral nerves, mainly of the digestive organs, as well. There are days in which a stimulant may safely, and ought to be, given to an apparently healthy child. When the baby can be taken from a stifling room to a gentle breeze, from the rear of his tenement with the exhalations of the sewer and privy to sea-air, or the mountain, it is not required. But when the hot season is at its height, and the baby suffering from it, without an opportunity to escape it, a few drops of brandy are required. Then it is simply a preventive remedy. The clamor of a few temperance papers and fanatics over the teaspoonful of brandy or whiskey, recommended in the rules distributed by the New York Board of Health, has not prevailed upon that authority to withdraw the advice, and has not prevented that advice from rendering good service.

I propose, therefore, that an ounce of either brandy or whiskey, per week, be added to the list of your foods for sale, during the four months from the 15th of May to the 15th of September, provided the weather is as dangerous as it must always be expected at that time. Whether you will conclude that the sale of the above article in the aforementioned quantity ought to be controlled by the advice or

direction of a physician, may perhaps depend on local or personal considerations, and must be left to your wisdom.

The furnishing of proper articles of food, in the manner proposed above, will prove health protecting and life saving. Still, proper food is but one of the sources of health and life. The heat and the atmosphere of a large city destroy many infants and children, in spite of appropriate food and tender care. Therefore the removal from both is urgently indicated. To prevent those who are still well from falling sick, and to restore to health those who have been stricken down by the heat of the summer, is of equal importance. An attempt to fulfill both indications has been made in New York City by the steamboat excursions made under the auspices of the St. John's Guild, for a number of children. Hundreds of children with their mothers are received in the morning on board a vessel, on which they are carried into fresh air, and fed on wholesome articles of food for some hours. For it is only a few hours that the excursion can last. The children have to be carried to the landing in the morning through the stifling streets, and back through the same in the evening to their stifling homes, and must wait on crowded docks before they can be admitted on board. It is far from me to detract from the good intentions of the guild which supervises, and the societies and individuals who pay for, these attempts at entertaining and saving, but it has always appeared to me that the possible good results are disproportionate to the labor and expense connected with the excursions.

There are in the neighborhood of New York two institutions which may be considered as the types of the attempts made up to the present time at either preventing or curing the diseases generated by the heat of the large cities. A reference to both may be found instructive when the plan of establishing a summer sanitarium on a large scale is being contemplated.

The Summer Home of the New York Children's Aid Society at Bath, Long Island, is established for the purpose of affording a temporary recreation of one week, or

one day, to the children mainly of some mission schools. Nothing, indeed, is amiss that is done for the children of of any age. But the question is permissible whether,—as so little can be done at the best by private exertions, and much must be left undone,—the large expense incurred for the recreation and pleasure of school children of, at an average, ten or twelve years, is justifiable, when the same amount of money, and the same good will spent on the instantaneous saving from imminent death of the many babies who die for want of just such a day or week, would be needed more and could be more profitably employed. When little can be done, that which is absolutely required should be done first. This is not meant to include a reproach, however, for a society which, with large means, is known to do a great deal of good. Still it is worth while to learn what is, and can be, done with the means at one's disposal.

The Annual Report of the Summer Home for 1879 yields the following facts:[4]

In the Summer Home:			
915 girls spent each 1 week	=	6405 days.	
268 girls spent each 1 day	=	268 days.	
734 boys spent each 1 day	=	734 days.	
1917	Total,	7407 days or 1060 weeks	

The expenses amounted to		$6387.18
Of which there were for construction and repairs	$1000.00	
For rent, 1878	350.00	1350.00
		$5037.18

No other expenses besides railroad fare are accounted for, thus the sustenance of every child for one day costs seventy cents in food exclusively, plus railroad fare. The

[4] Twenty-seventh Annual Report of the Children's Aid Society, New York, November, 1879.

expense for railroad fares amounts to $739.20, that is ten cents for every child every day (leaving nearly sixty cents for food, etc., alone) during the whole period, or, calculated for every week, eighty cents. This appears enormous, and again the question arises, whether the result, a single day's recreation for a girl or boy of ten or twelve years, where so very much has to be left undone, is not paid—I dare not say *too* dearly, but—dearly for, when the average amount of railroad fare is added to the cost of sustenance.[5] And it cannot be proven that a single life has been directly saved by either the exertion or the expense.

In this respect the aims and results of the Seaside Home of the Brooklyn Children's Aid Society, at Coney Island,[6] are quite different. It is no pleasure ground for school children, but a home for sick babies, struck down by the heat of the summer, and suffering from diseases of the alimentary canal. According to the rules, the babies are received on Monday morning and remain until Saturday night. Admission is granted to sick children of early age, very few being admitted over a few years of age, and then only when a sick baby requires the presence of its mother, who has no other home for the rest of her children, upon the certificate of any respectable physician of the town, or directly by the superintendent. Very few remain over Sunday, but admission is not restricted to Monday; any sick baby may be admitted any day. Thus it is that the average time a patient remains in the institution may be set down at four days, a period amply sufficient in most cases to restore the exhausted and dying tenement house unfortunates to a possibility of living. Then, too, one cannot assert that four days are sufficient in every case, but surely they are in the majority.

5 In a circular directed to the public for the purpose of obtaining contributions, the number of children "brought down to this resort" from the 9th of June to the 15th of September is pronounced to have been 2,912, and the weekly expense "some two dollars." I have preferred to be guided by the figures of the official report, which, however, appears over the name of the same gentleman who signs the circular.

6 Fourteenth Annual Report, November, 1879.

And at what expense? In 1879, the number of admissions amounted, during thirteen weeks, to

2423 children, and
805 mothers.

3228 × 4 days = 12,912 days.

The expense amounted to		$8331.22
Of which there were for alterations to building and furniture	$3748.20	
Building fund	571.04	
		4339.24
		$3991.98

These $3991.98 were the expenses for provisions, milk, ice, coal, drugs and medicines, horse, wagon, harness, and care, express, rent ($125), railroad fares (but $12.34), printing, insurance, salaries and labor ($1018.15), and sundries, that is thirty-one cents, daily, per head,—well spent on dying babies, most of whom would have succumbed but for these thirty-one cents, daily spent both humanely and intelligently.

Is it possible that a human being should have to perish because of the want of thirty-one cents?

The influence of heat on disease and mortality is felt mainly by children under two years. It is these to whom a summer sanitarium which has but limited accommodations must mainly be opened. When there is room, older children ought to be admitted, up to the age of ten, but the direct life-saving influence is principally felt by the children under two. The younger they are the more will they be benefited. As soon as a mother can leave the bed in which she was confined, she may transfer the baby to the sanitarium. When she has older children, who cannot be left behind, they must be admitted. No delay must be allowed in the cases of those sick with diarrhœa. Another night, a few hours in the stifled atmosphere of a hot city, will destroy a life, which may be, and often is, saved by removal

from its danger. In these cases the removal alone is the remedy. Where it is expected to act as a preventive, a few hours, a day, even, may be allowed to pass by. Those suffering from chronic ailments of nutrition, such as scrofula and rachitis, and those affected with chronic respiratory diseases, also convalescents from diseases gone through at home, ought to be counted amongst those worthy of prime consideration. In all of these cases whose sickness is the cause of admission, whether it be diarrhœa, chronic bronchitis, or scrofula, age is no longer a consideration, unless the patient is beyond or near the limits of childhood. In certain classes it is dangerous to allow older children, of twelve or more, to mix freely with their equals of either sex. Sexual consciousness is developed so early in very many that the responsibility in accumulating many, without very strict supervision, is too great.

Those who are poor have a good claim to be admitted; those who are poor and sick have the best, no matter whether the little human being happens to be the offspring of white or colored; Gentile, Jew, or Christian; wedlock, crime, or love; church-goers or agnostics. A human child not relieved or saved where there was a possibility ought to weigh heavily on the conscience of society. It is advisable, though, that the sanitarium should be large enough to admit such, although they may not be absolutely poor, as are entitled to consideration simply because they are young, and to be preserved and saved. The babies of the workingmen who are willing and capable of paying must find a better place than a boarding house, the prices of which are usually higher than the laboring man or small storekeeper can afford to pay. The babies of these ought to be admitted on paying the expense of their keeping, under the rules and regulations of the general institutions. They may be admitted for just the length of time which is allowed to the poor, whether the term be three, four, or five weeks.

To benefit a large number, I propose that an admission in every case be valid for four weeks. If advisable, a prolongation may be granted, or a new admission given. If the child be sick at the end of its term, no discharge must

take place. Removals against the advice of the institution are out of the question. Parents must bind themselves not to remove their young without the permission of the officers in charge. This rule must be enforced as much as the law of the land allows. It permits too much ignorance and cruelty at the best. I have seen low-bred, brutal, drunken people, tearing their children from their beds in a hospital ward, take them to what they call "home," and deliver them, who had every chance to live and get well, to a certain death. These are actual cases; the law permits the innocents to be slaughtered as family property, and the sanitarium must try to counteract the lawlessness of inhuman laws by forcing a certain restriction in the indiscriminate and careless removal of their charges before the stipulated time.

The adult accompanying the admitted baby has, besides, some office to fill. The mother who comes with the baby or babies is naturally bound to perform a certain amount of work for them. At home she takes care of the household, cooking, washing, sweeping, and attending to the children. In the institution she is expected to do the same. While her main services belong to her children, these services must be superintended and directed by the large household of which she happens to be a temporary member. She has to share in the general housework, washing, cooking, and sewing. It is expected that cheerful obedience to simple rules and not onerous duties will be considered as but a slight recompense for the boon conferred upon her and her child.

The case may occur, though rarely, that a person prove so disobedient and unruly as to necessitate her removal. Such a case is certainly rare, for those so inclined behave quite well when they are in the hands of an orderly community, deprived of the injurious influences of coarse example, loose talk, and bad drink; in such a case, when the mother is to be refused or expelled, the present laws will permit of the retaining of the baby.

I can hardly conceive of any other reason for removing a child from the sanitarium before the time has elapsed. For sickness must be cared for, as it must be expected to

happen. There will be occasional attacks of diarrhœa, of bronchitis, and pneumonia. There will be whooping cough, there may be diphtheria, scarlatina, measles, ophthalmia, varicella, even variola or varioloid. For the time being, that is, until the institution in some future time will be prepared to take charge of those already sick, such as are known to be affected with any of the above infectious or contagious diseases must not be admitted before their complete recovery. But those who are taken sick while inmates must find proper care and treatment in the institution. There must be a separate portion, of the same construction and material as the other buildings, at safe distances, for whooping cough, for diphtheria, for measles, for scarlatina, for varicella, for varioloid, for ophthalmia. There must be rooms for the temporary accommodation of those who come in with fever or any other sudden symptoms of a sickness not yet fully developed, but of a suspicious character. To return them to the city may be required in institutions crippled by narrow means and space, but the welfare of the patients demands that they should remain where they have an infinitely better chance for complete recovery.

What sort of buildings should be erected for the use of the admitted children and their attendants,—brick or wood, large or small dormitories, large buildings with small rooms, or large dormitories? One or more stories?

It is a mistake to believe that brick buildings are more proof against destruction by fire. I have taken some trouble to ascertain, as far as the reports were accessible, whether more public brick, or wooden, buildings were destroyed by fires. It so happens that the larger majority of those so destroyed were built of brick. For it is not claimed, nor expected, that they should be fireproof.

Nor can it be claimed that plain wooden buildings are apt to be easily destroyed by age and wear to such an extent as to render their erection and use objectionable. As the sanitarium is not expected to be opened for any but the summer season, wooden buildings, to live in, are certainly preferable. With but little expense they can be made rain-proof and wind-proof, and their proper and complete ventilation for the purposes for which they are erected offers

no difficulties, and requires no architectural ingenuity or pecuniary outlay. Large and solid brick walls, covered with plastering and wall paper, or oil, or cement, necessitate both; a wooden structure need only be left alone to secure good air and sufficient ventilation. Simple clapboarding, plainly painted, does not destroy the necessary spontaneous ventilation; large windows and doors admit sufficient light and air. Moderately high ceilings, from ten to thirteen feet, according to the size of the rooms, permit the rising of warm and foul air, if ever there be any, to a sufficient extent. Plain roof ventilation, or a ventilating apparatus near the ceiling, is all that I should advise or permit. Open windows, open doors, and the spontaneous and constant exchange of air through the wooden inclosures are fully satisfactory. As I have lived many a year, from four to eight weeks in succession, during July and August, in a small frame house, clapboarded outside, and with a plain vertical boarding inside, without any inconveniences, and with great advantage to myself and mine, I know that plain and cheap buildings will be eminently adapted for your purposes.

The question as to the general size of dormitories is an important one. Large dormitories have the advantage of easy superintendence, and some reduction in expense. Thus in orphan asylums, and similar institutions for children of advanced age, the use of dormitories large enough for a number of children has been found appropriate. But the wants of very young infants differ from those of the above-mentioned class. Very few babies, though ever so well, will sleep a whole night. Babies will wake up once or twice, and cry. They will require the lighting up of the room to have their wants attended to. Their attendants will have to get up, walk about, and disturb their neighbors, or the whole ward. When there are but twenty, or even less, babies in one dormitory there is disturbance all the time, in the way of noise or light. If that be so where all the babies are perfectly well, how much more will it be the case when one or more are not in perfect health. Amongst a dozen or two babies there are always some who are sufficiently disturbed by intestinal

catarrh, flatulency, or even lesser ailments, although there may be no actual disease. Thus the night's rest for all the babies and their attendants is more or less interrupted, not to speak of the exhalations of excrements, which annoy the neighbors as well as the individual baby and attendant. This is more than a theoretical speculation; it is the result of actual observation in hospital wards and other institutions. Thus I cannot advise the erection of large dormitories for the class of infants and children you propose to benefit. The houses, large or small, ought to be divided up into small rooms. These ought to be large enough to accommodate a mother, with all her children, when you will now and then find yourself under the necessity of admitting a whole family at once. It is perhaps not necessary to allow a separate room for a baby and its attendant; but two, or at the utmost, three such parties ought to be the limit. Whether small houses be built with a few apartments, or large houses with corresponding broad and well-lighted corridors to allow of freer ventilation and access of light, may appear to be of no moment. But as it is not proposed to employ deafening, it appears to be more appropriate to build a number of smaller houses in preference to a limited number of larger ones. The great number of rooms and walls in the latter requires so much more material than would large dormitories that the difference in the expense will not be very great. If it were, the advantage of separating the inmates, and by separation affording them better chances for rest, is so eminent that the moderate increase in expense is not worth noticing. The advisability, however, of separating the babies during the night, and in their sleeping hours during the day, does not exclude the usefulness and necessity of procuring large halls as a common meeting and play-ground for the better part of the day. There, noise and crying or any other mode of their enjoying themselves or expressing their wants is rather desirable than otherwise. Besides, the presence of all in common rooms secures the only possibility of close superintendence, as far as the cleanliness of the babies, and regularity of feeding hours is concerned. This close supervision is necessary both in the interest of the little

ones, and as a means of discipline for the adults, part of whom will always endeavor to benefit their individual children, by breaking the rules laid down for the whole community, as long as a wholesome habit has not been inculcated into them.

For the reasons given above, I think houses with but one story preferable, when the space is sufficient for erecting a number of them, with the allowance of enough space between each, to secure the free access of air. As, however, the houses are but low, the distance between them need not be great. In fact, if I allow a surface of one hundred and fifty square feet for a baby with its attendant as the size of a bedroom, a dozen such collected under one roof would form a house of thirty-six by fifty feet, or about two thousand square feet. A distance of ten or fifteen feet between two such houses, low as they will be, ought to be ample. A row of them ought to be connected on one side, with a continuous veranda for increasing the facility of communication, mainly for the use of the superintending nurses and officers.

The medical service of the sanitarium is of vast importance. There will be sickness, and good medical advice ought to be procured. It is possible, but not probable, that a superior man, and well informed in the physiology and pathology of childhood, will or can give four months of every year gratuitously. Such a contingency may be hoped for now and then, but cannot be expected. Thus, the physician-in-charge ought to be paid for his services. His duty will be to convince himself that the diet of infants and children and adults is just what it is meant to be; to see every room, dormitory, or house, and privy once daily, enforce sanitary regulations, and attend to every case of sickness. That is serious work, but it can be accomplished with the aid of assistants. These latter must be selected from the young physicians, or advanced students, who declare their readiness to serve continuously, for board and lodging, at least two months—better four. The facility for learning in your sanitarium will be so extensive that the places will be eagerly sought for. Eight or twelve such assistants may be required, double the num-

ber ought to be bidden welcome; for the institution, while it is meant to benefit the infants, can be made serviceable to the improvement of young medical men, and through them, again, to those whom they will have in charge in future. It will be easy to regulate the duties of the assistants; the number of infants, children, adults, houses, bedrooms, closets, and grounds under their charge must be determined by their superior officer; meanwhile, though the studies of each man are left to his own selection, a well-posted physician will do well to treat his assistants as a professor would his students, collect them in a class, discuss general topics connected with the service, and the class of the well and sick under their charge, direct their studies in infant pathology and therapeutics, see the cases with them at certain hours in either a Socratic or didactic manner, and thus prepare in every season, better than any of our colleges or clinics ever yet succeeded in doing, a number of young men for the knowledge of, and practice upon, a class of diseases which are very frequent, but like sealed books to the young, and many an old, practitioner.

The infants and children remain a number of weeks in the institution. The benefits to be derived therefrom are expected to be very great for every individual, through the immediate effect of the sojourn there. I expect, however, a lasting effect also from the sojourn of their attendants and mothers. When they leave they ought to be wiser and better. Their weeks of staying in the sanitarium must be like a school to them, and a source of information. They will gather some information simply from being told what they are to do for the little one in the way of dressing, cleaning, and airing, and from learning the manner of feeding and the articles of food appropriate. But more can be done, and easily; they can be taught theoretically besides. I propose that ten or fifteen minutes every day should be given to a sort of simple lecture on just such topics as are connected with the diet and bringing up of children. A woman who stays in the institution a month or two ought to take with her, when she leaves it, a stock of very plain knowledge on a number of points connected with the health and sickness of babies: How many passages

from the bowels are normal, how they ought to look, and what their consistency is to be; how to bathe a child, how to dress it, how to keep its feet warm and head cool; the danger of short socks, feather pillows, and woolen headgear; how to prepare an enema, and apply it; how to observe the voice of the crying child, and judge of the frequency or difficulty of breathing; what to look for in the growing child,—accumulations of filth and dead skin on the head, growing mother's marks, increasing baldness on the occiput, softening of the cranial bones, thickening of the long bones; what to think of the presence of or danger from worms; how not to believe in the old superstition of dentition being an almost unavoidable danger; and that she is culpably neglectful when not trying to relieve, by medical aid, a diarrhœa, or fever, when her child is sick, only because her neighbor tells her the child is teething. All of these things are very simple, and can be told in simple words. Any woman of average intelligence, and with no previous schooling, will comprehend and remember them. I know that I succeeded in private and dispensary practice in a great many instances, and the task will be found very much easier when the teaching comes to them in an official manner and clad with authority.

I admit, however, that not every advanced student, or even every young practitioner, is conversant with all of the above topics to such an extent as to be able to teach them; but their superior medical officer is so, or must be. He can supply the knowledge, and when no *viva voce* teaching is possible or advisable, short directions, or lectures, can be provided. The purpose in view must be obtained, at all events. If there were none in the whole medical staff who would feel capable of teaching the above subjects to the by no means unsophisticated, but mostly slow and plain intellects before them,—and there is nothing more difficult than a popular lecture, or popular teaching,—a good book ought to be procured and read aloud; if there be none adapted to the purpose, it ought to be made. A great deal of common sense and judicious knowledge can be condensed in forty or fifty pages, and a single page read every day, and discussed ten or fifteen minutes,

may be able to change the condition of the poor little ones of a large city in a few years by removing ignorance and superstition, and breaking the force of bad habits in their mothers. When these leave the institution, the babies must have laid in a stock of health, and they themselves one of good will and some improved knowledge on children and nursing.

The information gathered by the mothers during their stay in the sanitarium I look upon as highly important. They will not only be told what to do, but made to do it. The class of people from whom your beneficiaries are recruited never learn by theory alone, it must be accompanied by practice; still that theory is a necessity for them also, and a blessing, provided it be in the right shape: therefore the teaching ought to be plain,—what they listen to, intelligible; what they read, clear and brief. It cannt be expected that extensive treatises on hygiene, or hygienic measures, should be read and digested by the men and women of the working classes, but brief rules will be read and heeded. The effect of the very brief rules for feeding babies usually distributed by the New York Board of Health goes to prove it. A short tract of a page or two, or better one large page, several times a year, ought to be carefully worded and widely distributed; every mother ought to be supplied with two or three when she leaves the sanitarium. At regular intervals the infant food depots, or some other public place, might be made the distributing centre of another such tract. One or two topics might be treated of at the same time, such, for instance, as have been mentioned above. A lithograph, or cheap print of a subject connected with baby life, could be distributed every Christmas, with the main rules concerning feeding, washing, airing, and dressing, underneath, on a strong pasteboard, so as to secure its indestructibility, and its forming a part of the wall ornaments in the residence.

Such rules, tracts, and pictures could be copied indefinitely. They may be kept for sale in the interest of benevolent individuals and societies of other cities. It may be that Baltimore can thus be made the centre from which every large or small city can be induced to obtain its sup-

ply of useful, plain knowledge on diet, health, and sickness of the young. . No other city, it appears to me, will have the opportunity of Baltimore, with the magnificent occasion offered by your undertaking. The publicity of your work, and its details, and of the facilities offered by you, will not be wanting; for the newspapers and journals will have no more interesting or more important topic to discuss for a long time. They will also contribute to diffusing the knowledge you intend to spread, by copying your publications, and though but a limited number of readers will cut out—as I have seen them doing—just such items of domestic and hygienic importance, the notoriety given to your plans, and their execution, will create a constant demand for the supply of your communications, papers, or tracts. Again, they must be brief, not one in a hundred working men or women will read an essay, but everyone will read a page of clear print with home truths.

Lectures are out of the question; poor people cannot go, and will not. Clergymen, as a class, have no special familiarity with the topics alluded to, nor would many of them be disposed to take an active interest in matters involving merely the health of the body. There are, however, some who would aid in the development and progress of such a trust as this, and appreciate the necessity of now and then giving a thought and word to the well being of the future citizen of this world.

Lectures, however, to another part of the community, which may be printed or not, will be found of great service. The educated and better-situated classes of society will listen, and read. Your efforts are mostly directed to benefit the children of the poor; but, even if you meant to, you cannot prevent the seed you sow from spreading beyond your own acre. The knowledge you spread, the habits you inculcate, the success you obtain, will tell their own story. The talk of the people, and the discourse of the newspapers, will spread healthy opinion all over. There is no better teaching than by example, which is not only good, but has proved profitable and successful. But the indirect influence of your efforts need not be all; a few lectures every season on subjects connected with the ques-

tions so dear to you must be delivered in Baltimore, by persons whose position and reputation is such that their assertions carry weight. These lectures, or some of them, ought to be printed and kept for sale. The book trade and the news agencies would distribute them by the thousand, by the ten thousand; and while most advantage would be derived from them by the publisher, your funds may be benefited by the profits obtained. Even though it would be necessary to pay the lecturer a fee, it is more than probable in my mind that a considerable pecuniary result might be accomplished.

Thus far I have proposed that what is known to the best of the medical profession should, in its results, be communicated to the public by teaching, tracts, and lectures; your corporation may go further, and contribute to the improvement of the science of the subject. I advise that a subject be selected by you, or by a committee of yours, annually or biennially, belonging to the domain of diet, physiology, and pathology of infancy or childhood, and that a prize should be established for the best competing paper on the subject. No money ought to be paid for the best effort. A medal gained for scientific honors from your body will fully pay the crowned winner. It is not at all necessary, or advisable, that the question proposed should be taken from the domain of diet alone; on the contrary, it is rather advisable to select a problem out of the many which are still waiting for their solution. America has not contributed very much to pædiatric science. I hope it is you who will succeed in creating the taste for it, and usher in a most needed progress.

To provide the poor infants and children of a large city with wholesome food, and to establish a summer sanitarium for the prevention and cure of the diseases depending on heated and contaminated air is an undertaking of vast importance, and in itself a great blessing, such as no other corporation in any community ever had an opportunity of conveying to the same extent. The thoughtful benevolence of Thomas Wilson, however, and the careful preparations being made by your board for the execution of his will and the administration of his bequest, encourage me in put-

ting in a further plea in behalf of the poor and sick infants and children. It is true that even large means do not suffice for all purposes, but these purposes must be first stated to be generally understood, and aims must be pointed out first before the efforts can be made to reach them. It has often appeared to me that misery is so great and universal only to enlist greater and more universal sympathy, pity, and humane efforts to relieve and remove it. The historical development of mankind which led to poverty, sickness, and sin has also evolved wealth, knowledge, and humanitarian enthusiasm. The race of the Hopkinses and Wilsons cannot be, and is not, extinct. If the means at your disposal be not sufficient to accomplish all that is required, I trust that they will be increased by well-directed benevolence of citizens equally blessed with great riches and great souls.

My plea is for the establishment of children's hospitals. It is true that there is hardly a general hospital in which sick children are not met with. They are mostly chronic cases, bone diseases, malformations, and disorders of nutrition. For reasons connected with the general discipline of a hospital, and the difficulty of procuring fresh air to a sufficient extent, the latter class are seldom benefited. The first class, also, are but rarely benefited, unless they be of recent origin. If there be any class of diseases dangerous to other patients, and not improved themselves, and which requires special accommodations of their own, it is that of chronic bone diseases. All of these children are, as a rule, kept in wards of adults, there to be cared for partly by the nurses, and partly by the convalescent patients. This usage is of little advantage to the sick, while it may prove an annoyance, and detrimental to the class of legitimate inmates. Besides, the association of older children with most of the inmates of a hospital is not an advisable one. The moral tone of the wards is mostly not very elevated, and it is a wrong to expose the children —subject already to so much doubtful home and street influences—to moral contamination in order to obtain a rather uncertain physical benefit.

Infants, who are so much more liable to be taken with

acute and life-endangering maladies than the class we generally meet with in hospitals, are not admitted. Thus, those who require most aid receive none.

To obviate the incongruities and disadvantages of placing infants and children in the same wards with adults, in some hospitals, a special ward has been reserved for children; but by so doing, the administration of an institution being of necessity, uniform, no justice is done to the wards of the young, as I shall say later. The classes of diseases are so various, the number of contagious affections so great, the propagation and multiplication of disease in a single ward or two, with no possibility of removal or isolation, so palpable, that this arrangement has been found to be dangerous in many cases, though in a number of instances it proves serviceable. Contagious eye and eruptive diseases are often multiplied in a child's ward.

One of the reasons why the number of children's hospitals is still so limited in most countries, and mainly in ours, may be found in the fact that the needs and wants of an institution designed for the care of sick infants and children are very much more complicated than of those for the reception of adults. The difficulties alluded to are so serious that there are so-called children's hospitals which will receive no patients at less than five years. On the other hand, those who understand their duty, and mean to do it, take the responsibility when it offers itself. Thus the child's hospitals of St. Petersburg, Vienna, Stettin, Basle, Berne, and Frankfort have a percentage of from eight to twenty-seven per cent. of inmates under a year, and of from thirty to fifty per cent. under three years. The children's ward of the Mount Sinai Hospital, New York, never asks for the age of the patient before deciding on the propriety of admission.

Amongst the difficulties to overcome in a child's hospital is the necessity of procuring an increased number of nurses. The mortality of children is greater than that of adults, their diseases mostly more changeable, their personal wants must all be attended to by others. Thus the number of nurses is to be larger than for the same number of beds in a general hospital for adults; and the

training of the nurses, if anything, more careful. The wards must be smaller, for the patients are more apt to disturb each other; therefore not too large a number must be congregated in one ward. The largest ward of a large child's hospital ought not to have more than from fourteen to twenty beds, part of which ought to contain convalescents. The number of smaller rooms must be greater; they must be so arranged as to be capable of complete isolation, when this is required, along a light and airy hall. The cubic space reserved for each child must be at least as great as for adults, for their respiration is very active; their evacuations are in part passed into the beds or linen, or at all events inside the sick-room, and a larger staff of attendants and nurses is present in addition to the patients themselves. Not only a sufficient cubic space, perhaps of 1500 cubic feet, is required; it is perhaps of still greater importance that the distance of the beds from each other, and from the walls and windows, be made ample, in the interest of comfort, and of nursing and attending. More of these minutiæ, however, come into consideration when the building of a hospital is actually contemplated. My object was only to show that the difficulties in the way of a child's hospital are rather greater than those met in general hospitals, and thereby, certainly not to discourage the undertaking, but to secure complete and perfect preparations. We have done but little in our country for the benefit of sick children, as far as hospitals are concerned. In fact, there scarcely are any, if those institutions are excepted, which, under the name of nurseries, succeed in so keeping and nursing their little inmates, that those admitted in health are soon taken sick, and those taken sick die; this is by no means an exaggeration. If there were a close superintendence on the part of the authorities over the many so-called private institutions for which cities and states pay largely with the understanding that they never look into the manner in which their money is spent, they would be surprised at the death-rate of the inmates. When ten years ago I proved that a large institution in New York City spared almost none, literally, of its many babies, I was requested to resign my position, and, when I insisted

upon publicity, expelled, and the very next annual report exhibited the fact that the admissions of children not born in the institution were almost exclusively of those near or over two years, when both danger and mortality are naturally lessened.

Many countries have done more than ourselves; none, however, enough; still there are a few European cities which have accomplished a certain result in procuring accommodations for their sick babies and children.

The following table has been taken from Rauchfuss, in Gerhardt's Handbuch der Kinder Krankheiten, i. p. 419:

	a. Beds	*b.* Patients Annually	*c.* Patients in Dispensaries	For every 10,000 Inhabitants at the rate of		
				a.	*b.*	*c.*
London .	510	2,500	60,000	1.4	7	170
Liverpool .	80	484	8,000	1.5	9	150
Vienna . .	300	2,000	25,000	3.5	23	300
Manchester	210	——	14,250	4	—	300
Prague .	92	1,180	7,220	5	60	360
Moscow .	280	——	——	7	—	——
Paris . .	1,100	7,100	35,000	6.5	38	200
St. Petersb'g	470	3,000	30,000	7	42	420
Lisbon . .	160	——	——	7	—	——
Stettin . .	56	280	1,000	7 3	37	130
Basle . .	60	230	232	12	50	50

It contains the number of beds in children's hospitals, the annual number of patients, and patients of dispensaries.

In Dr. Rauchfuss' opinion the highest above figures are still to be considered as minima; ten beds with seventy annual patients, and five hundred dispensary patients to ten thousand inhabitants, will not be found to surpass the needs of the community.

Dispensaries for the children of the poor are a necessity as well as hospitals. Many cases of sickness require

no hospital treatment, and no superior knowledge of nursing, such as a well-kept hospital can alone supply. Slight ailments which, when either not understood or neglected, become great evils; malformations which can be remedied by an occasional dressing, or manipulation, or operation, at longer or shorter intervals; chronic ailments which require the same or similar medicinal treatment, besides advice in regard to diet and nursing; many an acute case even which will run a favorable and smoother course, when once guided and directed,—all these numerous cases are sufficiently benefited by dispensary treatment.

The opportunities of a dispensary are twofold: it acts as a healing institution, and prevents, by its easy accessibility, many a trifling complaint from becoming a serious malady. It affords medical advice and medicine. In some Paris dispensaries baths are given besides. The out-door department of the Prince Oldenburg Child's Hospital in St. Petersburg has, moreover, a room to rest in for those who come from great distances. Its second great opportunity consists in its ability to prevent disease by sound advice given. It is a fit place to teach simple lessons, to distribute brief tracts on hygienic subjects.

There is a serious drawback, however: the child needing advice and going to obtain it, in a dispensary, is necessarily exposed to the air; many a sickness may be, and has been, rendered severe by such exposure to all kinds of weather. The time spent in waiting before the individual patient's turn comes is a serious infliction upon its comfort, temper, and sometimes health. It is, while waiting, exposed to the possibly contagious diseases, wittingly or unwittingly brought to the same place, for this is a possibility which cannot be altogether avoided, though some large dispensaries in Europe have a place in which a cursory preliminary examination concerning contagious diseases is made before the patient is admitted to the general waiting room.

It is, however, not only the sick child who may be injured by being taken to a dispensary; as it is liable to be endangered by others, so are others by it. The danger of spreading contagious diseases is enhanced by the indiscriminate transport in public vehicles, which cannot be pre-

vented. Thus, whatever is done, is not always for the best—as in all human things. Nor can such danger always be avoided. Possibly the establishment of several small dispensaries in place of a single large one, and greater facilities for the treatment of sick children at home, and the procuring of more extensive hospital arrangements, are amongst the improvements and blessings to be wished for.

At all events, as the danger of communicating diseases is so very great, it is advisable not to have the dispensary department, although it may be connected in its administration with a hospital, under the same roof. If barely possible it ought to be in a separate building, and care taken that no communication takes place between the two. No nurse of one ought to attend in the other.

There can be but one connection, which is this: the outdoor department is necessarily the feeder of a hospital; cases too severe to be treated at home under unfavorable circumstances or such as would be injured by letting them return home, must be admitted to the hospital immediately.

Both hospitals and dispensaries wield a wider influence, however, than through their immediate effect only upon those whom they directly influence. Their mediate blessings are at least as great, perhaps greater, for the greatest boon to infants and children is the increased number of physicians who are intimately acquainted with their nature and ailments. The field of observation in large institutions is so great, and the opportunities for learning so extensive, that the medical men connected with special establishments of the kind cannot but progress rapidly in the knowledge of the topics connected with that special branch of practice. It is only the half-educated, or poorly gifted of them, who would be induced to look upon the practice in children as a specialty. In fact, the tendency of running off into unjustifiable specialties to such a degree as is done in our country and in a few centres of Europe, for instance in Vienna, is but the outgrowth of insufficient general education or mercenary motives. The really educated and intellectual physicians would avail themselves of their opportunities for the benefit of their

charges and their peers; for it is to them that the profession would and has to look for further instruction and progress. Their assistants and clinical pupils—for I take it for granted that the advantages of observations would not be lost, no matter whether the hospital and dispensary were closely connected with Hopkins University or not—would learn directly, participate in their observations, study their method, and go out well prepared for the strife with disease. Their clinical lectures, their papers in medical journals, their publications in the annual reports would not only contribute directly to the stock of knowledge of medical men, but—and that is of vastly greater importance yet—create a widespread interest in the physiology and pathology of childhood. That it is necessary to still create such an interest is a remarkably sad fact, but such it is. Not one of the colleges of the United States twenty years ago but had a "chair for obstetrics and the diseases of women and children,"—not one, not a single one of them, which ever taught diseases of children either theoretically or practically. The first clinic for diseases of children—a poor single hour every week—was established in the New York Medical College. When this closed its doors, the clinic was transferred to the University Medical College, it still being the only one in existence. During the last ten years, a few of the larger colleges of the country have imitated that example, but without admitting the teacher of diseases of children to the acknowledged position of a member of the faculty; and without making the study of the diseases of children compulsory on the part of the students, without subjecting them to an examination on that subject before they are given a diploma, which gives them a right to go out into the world to destroy or spare—as fate wills it—their neighbors' young offspring. And all the time the teacher of obstetrics calls himself also the professor of the diseases of women, and the professor of obstetrics and diseases of women calls himself, also, professor of the diseases of children. Thus it is not only that the study of the diseases of children has been neglected, but that a young student is led to think of it as a rather superfluous task. Besides,

babies and children in practice are easy to deal with, for they cannot resent ill treatment, claim damages, or impair the good doctor's reputation by complaining.

All that may be changed by you, in Baltimore, and beyond the city's limits. For while a bad example is contagious, a good one is fortunately, at least, just as much so. I feel that a single earnest attempt is all that is required. When it is made at Baltimore, with its just expectation of becoming the centre of learning, and particularly medical learning, in the United States, it will be doubly effective.

The hospitals for sick children, and hospitals in general, are necessarily limited in their means, the space they occupy, and the accommodations for beds which they offer. A large city ought to have, therefore, in proportion to its population, several institutions for rather different purposes. An institution for the relief of acute inflammatory diseases, while located as healthily as possible, must necessarily be at no unreasonable distance from the homes of the sick; for transport to a distance is, of necessity, attended with dangerous consequences; many a patient dies of it.

On the other hand, places destined for the relief and cure of chronic ailments, such as rhachitis, scrofula, bone diseases, ought to be established at a greater distance from the cities, on mountains, or the sea-shore; chronic pulmonary diseases require plateaus protected from changing winds and temperatures.

Professor G. Barellaj, of Florence, Italy, founded the first sea-shore hospital for chronic ailments in Viareggio; and in 1873 as many as eighteen existed in Italy, that were founded on the same plan. Count Ricardi de Nestro established, in Turin, a hospital for rhachitic children in 1872. Within a year, two additional ones were called into existence. Moral contagion is not always detrimental in character. In Milan, Dr. Pini founded a similar institution. The hospital for scrofulous, rhachitic, and anæmic children, in Berck-sur-Mer, admitted, between the years 1861 and 1865, 380 children, of whom 234 recovered, 93 were improved, 35 were not improved, and 18 died. The stations

at Venice, Rimini, Seotri, and Fano had 1359 recoveries, and 758 partial recoveries, out of 2283 admissions. The establishment of Oranienbaum, near St. Petersburg, Russia, admitted 217 children at an average age of nine years, of whom 96 are reported as recovered, 95 as improved, 20 as not improved, 5 as worse, and 1 dead. These percentages of entire recoveries in a class of cases which, under ordinary circumstances, give rise to protracted illness and lingering are so satisfactory, that the very mentioning of them ought to be enough to enlist the warmest sympathy in behalf of a class of children who, while suffering from the curse of inherited poverty and acquired ill health, might be readily aided by the benevolent efforts of wealthy individuals,—or the collective means of society. They are the very class who, when they grow up with their ailments and incapability to produce, will, through the course of their lives, consume the marrow of the land in hospitals, refuges, almshouses, and penitentiaries.

A large number of children, and very often healthy and vigorous ones, are destroyed yearly by infectious and contagious diseases. Municipal consciences have been awakened sometimes to the knowledge of that fact, and endeavored to guard against it by closing school rooms in the faces of children coming from infected houses. This is a necessity from the point of view of protection to the well. From that point of view it is even explainable and justifiable that the whole population of a tenement house, in which a single case of communicable disease happens to exist, is driven back to its dens; all of this is just and proper on the part of those who do not yet suffer, but is it just and humane when considered in the interest of those locked up in their pestiferous atmosphere? Or does this very process of locking up yield any favorable results?

By no means; for the fact is undoubted that from one or more such infected localities the epidemic will spread; it is apt to spread in the same degree that the population is densely concentrated around the infected locality. That is natural enough, for the disease will spread where it took hold, the number of cases will increase, the character of the epidemic become graver. If the first case could have

been removed, isolated, and taken care of, the malady might have been stopped, lives and means been saved, and the community effectually protected.

Now, general hospitals do not admit contagious diseases, though some of them, for instance, the Victoria Hospital, London, England, have fever wards for the admission of that class of cases; there is always one or the other communicable affection which is not allowed to enter, thus, for instance, small-pox. The majority of hospitals remove from their wards even such as are taken with contagious diseases while inmates of the same. There are but few, and particularly but few children's hospitals in existence which have the opportunity of isolating those who are taken sick so as to require separation. Such are the St. Wladimir of Moscow; Nicolai, Elisabeth, and Peter Von Oldenburg, of St. Petersburg, or the Child's Hospital of Basle (Switzerland), or Lisbon, the Eveline Hospital of London, and also some others, to a certain extent Vienna, Prague, and Stettin.

If there were hospitals enough with sufficient accommodations for the isolation of those who are taken with a contagious disease after having been admitted for other reasons, and other hospitals established for the acknowledged purpose of receiving at once those taken with communicable affections in their residences, these homes crowded with children and adults would be protected and saved, and many a fatal epidemic stamped out at the beginning. The unnecessary and preventable waste of life is fearful, and if the waste of property annihilated by preventable disease and death was counted, or could be estimated,—with the loss in material, money, labor, time, health, and comfort,—the political economist would be surprised.

It is not too early, then, to emphasize the necessity of establishing hospitals for the reception and treatment of contagious diseases. They are required in the interest of those taken, and those who are still well and almost certain to be taken. In regard to small-pox, some communities enforce the rule of isolation even against those who are unwilling, in the interest of the whole community. Small-pox, however, as we meet it, in both sporadic cases

and epidemics, and modified by vaccination, is by no means the most dangerous scourge; many an epidemic of diphtheria and scarlet fever has proved more fatal than varioloid. Special hospitals are a necessity, and public opinion will not always be satisfied with halfway measures. The progress of human development will insist upon the necessity of greater protection for the community, and better accommodations for those who suffer from the most dangerous forms of sickness. Besides, humane thought and sympathy will readily be enlisted in behalf of those who, while suffering most seriously and most frequently, are most helpless; for childhood is the harvest-field for the murderous epidemics. The man who, in any town of the globe, will sacrifice part of his wealth for the erection of a hospital destined for the exclusive reception of children suffering from contagious diseases, is sure to make his name a blessed household word, and crown his head with immortal glory.

THE JOHNS HOPKINS UNIVERSITY

On the twenty-fourth of December, 1873, a man died in Baltimore who had succeeded in erecting to himself a monument the inscription of which will never become effaced. The old question as to whether human progress is a thing that cannot be checked, whether it would consummate itself independently of the personal influences and exertions of various individuals, or whether it is determined by individual activities without which it could not be effected, has of course not been fully answered by his life and deeds, but the personal element in the conception of history has certainly gained considerably from his example. This one man and this one man's knowledge and feeling will have obtained such a significance for the spiritual and intellectual development of this country that it is well worth while to begin the history of the Johns Hopkins University with that of Johns Hopkins himself.

He was born in Anne Arundel County, Maryland, near Annapolis, on the nineteenth of May, 1795. His grandfather, of the same name, was one of the few men—all like himself belonging to the Quakers—who, long before the revolution, had already declared slavery to be an unworthy and inhuman institution, and—after the manner of Quakers—had put their convictions into practice. He emancipated his hundred slaves and worked his lands, as well as he could, with free labor. His son Samuel, the father of Johns, was forced to buy out his brothers' interests and thus had his means considerably reduced. His wife Hannah seems to have been the soul of the domestic hearth and her word was not without influence in the management of the property and even in the annual meetings of the community. She is pictured as a woman of great strength of character and of ripe intelligence.

Her son Johns was the oldest of her eleven children. A

large part of the farm work was performed or managed by him. In addition to this he was the teacher of the younger children. He early developed a strong desire for learning, and greedily devoured all the printed matter in the county which was accessible either on foot or on horseback. When, at seventeen years of age, he left the farm, he had read all the books in the neighborhood—perhaps not too great a number in that slave-holding part of the country. To this passion for reading he remained true to the end of his life. By the time he died, he had collected and studied a library of two thousand volumes mostly on historical and biographical, but partly also on poetical topics. Shakespeare seems ever to have remained his favorite poet.

In 1812 he removed to Baltimore, where he remained to the end of his life. He was for many years clerk in a wholesale grocery business until in 1819 he established himself on his own account. At that time he possessed a thorough knowledge of his business, showed strict economy and all the tenacity and circumspection of his sect, and owned four hundred dollars. In his establishment there was a great number of empty boxes and barrels and all sorts of samples; but these were samples by which he either made sales or which he actually sold and then quickly replaced. Application to business and good luck remained with him from that time on. At the time of his death he owned one hundred and fifty warehouses, of which not one had ever burned down.

He accumulated his great fortune in his business, in his stock transactions, and in later years, from the natural income of his earlier accumulations. That which often appeared to be mere luck was simply the direct result of his sound judgment and insight. Thus, for instance, in the year 1847 he was one of the directors of the Baltimore and Ohio Railroad Company, which was then in a condition nearing bankruptcy as the construction of branch lines which were absolutely necessary for the growth of the main road had exhausted all its means and there were no new resources to draw upon. He freely offered his whole private account, the company was tided over its difficulties,

and at the time of his death he still possessed two millions in shares.

Of course he in no wise limited his business operations. He bought real estate wherever he had the opportunity and at once improved it and built on it. Many of the best houses in Baltimore have been erected by him and some parts of the city have increased in value through his initiative.

This is about all one has to say of his outward life. The only biography of him that I know of appeared in the *Unitarian Review and Religious Magazine* for August, 1877, by Caroline H. Dall. She points out that the incorrigible bachelor was not as strict as might be desired in respect to a certain kind of morality. But the fact is that in his testament only sixteen nephews and nieces figured as heirs. To each of these he gave fifty thousand dollars, adding, "Whatsoever is more than this cometh of evil."

He was not what is usually called a charitable man. Perhaps he denied himself the fleeting enjoyment of momentary giving in the interest of a greater purpose. He gave no alms. He more often denied than granted. His refusal was at times couched in these words: "My money has its master. My money is not for you. I need it for my purposes. Besides, I have not made it." But when he did give he had a definite purpose, and without such he did not give. For the erection of a meeting-house for his sect the multimillionaire could spare but three thousand dollars. But to a commercial house which could not make any headway because he collected his rents inexorably, he voluntarily gave ten thousand dollars to ease up business. Other loans made with the same purpose he refused to take back, saying: "Continue to loan to others in a similar manner." "His word was as heavy as lead," a negro once said of him. A promise he never forgot. And wherever he saw a chance for great personal gain he willingly gave the same opportunity to others. His portrait can be found in many Baltimore counting houses.

He finally came to rely upon his steady luck. His friends knew for what purpose he hoarded his money and, towards the end of his life, grew anxious lest he might

die without adequate preparation. One day Mr. King asked him, "Why don't you make your will? Make it at once." Hopkins' cool answer was—and not very long before his death at that—"Don't be uneasy. I'm not yet quite ready."

He did get "ready" at last, however, when on August 24, 1867, at the age of seventy-two, he had incorporated by the state legislature the "Johns Hopkins Hospital" and the "Johns Hopkins University."

The management of both institutions was in part vested in the same board of directors This is why both are so often spoken of together. Indeed, they belong to each other in so far as, according to the view of Johns Hopkins, the hospital should be an essential factor in the work of the university. Hence, his attention was early centered on the preparations for the hospital. Five renowned physicians were charged with the elaboration of plans. Of these not one was finally accepted in its entirety, but one of the gentlemen, Dr. John G. Billings, was retained in the capacity of health officer and expert. These plans and the one definitely accepted have gained wide popularity. In every great library in Europe and in many great sanatoria they are looked upon as standards. Hopkins' original plan embraced not merely a hospital but also a training school for nurses. The zeal with which, in spite of many an obstacle, the well-known Bellevue Hospital Training School for Nurses was founded in New York, was kindled, fostered, and made fruitful through the instigations of the old Baltimore merchant. This first requirement is contained in his first letter to the board of directors. Along with this he insisted upon equal privileges to colored people, and upon the construction of an asylum near the hospital. Finally, on the 10th of March, 1873, he issued his instruction to the board of managers, to whom he at the same time assigned thirteen acres bounded by Wolfe's monument, Broadway and Jefferson Street, for the construction of the hospital. Enclosed with this was one hundred thousand dollars to begin work. The motto, however, from the very beginning was, "Make haste slowly. Do not touch the capital. Work with the inter-

est. Do nothing for show. No expensive buildings for the university."

The extensive grounds should first be levelled to the highest natural point. After perfect drainage the construction should slowly commence. Nothing should be accomplished without the advice and assistance of American and foreign experts. The hospital should be for the poor and sick of all ages, sexes, and races, and in addition should include an asylum for four hundred colored orphans. Provision should be made for establishing a department for convalescents in the country, and in the main building accommodations should be provided for strangers and for pay patients. The hospital was to form part of the university. In other respects, however, the managing board was to have perfect freedom of action. Fortunately its members were as consistent as its founder was perspicacious. The eight million dollars and the three hundred and thirty acres just at the gates of Baltimore with which the beginning was made are yet intact, and it is already years that the university, which is still in the process of formation and development, is actively pushing its work, while nearly a dozen extensive hospital buildings have been completed.

In the fourth annual report of the Johns Hopkins University, published in 1879, the president of that institution tells us that the board of directors convened some time after the death of the founder. Its first session took place on February 6, 1874. It was decided to hold conventions and to enter into correspondence with presidents and professors of American schools for higher education, and to visit the most renowned of these. Moreover, a representative was sent to Europe to study the universities of the old world. On February 22, 1876, *i.e.*, two years later, the results of the previous studies and findings were announced, a teaching corps was organized in the course of the following summer and fall, and instruction begun on October 3, 1876.

In their plans the members of the board of directors took for their point of departure the view that it was not worth the trouble simply to add another to the many

existing American colleges, but that the attempt should be made to raise the instruction and education to a higher level and in this manner to be of value not only to the circumscribed locality of Baltimore, but to the present and future needs of the whole country. There were, of course, many ways of attaining this end. The fund was large and yielded a good income. Religious and confessional fetters there were none. Perhaps Washington, the political center of the nation, with its collections in the Smithsonian Institution, with its famous anatomical museums, with the finest library of medical journals in the whole world, might have been a more suitable place for the establishment of the university, nevertheless, Baltimore, which is in its immediate neighborhood, was the next best place. Furthermore, this city had institutions with which the new institution could be in touch and could work in common. There was already the Peabody Institute, with its one and a quarter millions, its large and ever-increasing library, its courses of lectures, its art museum, and its institute of music; a large hospital in course of construction; the Maryland Institute, a technical school; the Maryland Academy of Sciences, with its Museum of Natural History already started; the schools of law, medicine, dentistry, and pharmacy; the libraries of history, law, commerce, and medicine; and a large number of educational institutions, from the elementary schools to the State Normal College.

All these various institutions were to be utilized as auxiliaries. That much was clear. But it was much more important to decide just what the position of the new institution was to be. Models there were in the American, English, French, and German institutions of learning. The American institutions, however, whether they bore the name of universities or not, were not really such, but were merely advanced secondary schools. The instruction in these higher schools—colleges—is partly elementary, formal, limited to a certain set of subjects. It forms the necessary steps preliminary to a university education. The college gives instruction, but it does not yet educate. It imparts a sum of knowledge without which spiritual culture never attains its highest point, but it does not supply

that culture itself. On the other hand, the university, which presupposed instruction at the college, the lyceum, or the gymnasium, has to impart the best possible instruction in literature and the general sciences, as well as in the learned professions. Furthermore, it should accumulate libraries, apparatus, works of art, and specimens of natural history on a large scale. It should also give guidance and encouragement to independent scientific research. Finally, it should confer degrees.

In this connection allow me to make some further remarks.

The higher schools of the United States, about three hundred in number, almost never correspond to what in Europe, and especially in Germany, is understood under the name university. There are only a few, like Yale and Harvard, for example, or the State University of Michigan at Ann Harbor, or certain proposed institutions in the Far West, which really embrace various faculties in the German sense of the word. The very names of college and university are employed indiscriminately. Frequently indeed the preference is given the latter just as they readily talk of an Academy of Medicine in some small country town, of an Academy of Swimming, or an Academy of Dancing. There are colleges in our country which require a certain amount of knowledge for admission and where a prescribed plan of studies is followed by all the students. Such colleges as these are represented by Yale. There are also colleges, such as the University of Virginia, which do not make such requirements and where the student may do what he pleases in certain schools or courses after he has presented himself for attendance either with or without elementary preparation. A few of the colleges have preparatory schools where instruction is given in elementary or in other preparatory subjects. Others have courses—so-called post-graduate courses—in which subjects are taught which go beyond the average requirements for a diploma. To the latter class belong Yale and Harvard. Others again, such as Cornell University, have parallel courses, where the matriculate studies certain definite exercises, generally by the aid of

daily quizzes in primary school fashion. In the best and most progressive of these institutions where the course, as in Yale and Harvard, lasts fours years, lectures, examinations, and written exercises succeed each other just as they do in a German gymnasium. The subjects taught in these institutions are also quite the same as those pursued in the German gymnasia. The fact that they are greater in number, that they include also Rhetoric, Astronomy, Natural Theology, and the Evidences of Christianity, Anatomy and Physiology, Moral Philosophy, and other matters does not seem to add to the depth and contents of the manifold subjects studied. At least I have never come across a graduate of a gymnasium who, like two graduates of Yale, could not translate the trivial sentence: "Supra posse nemo cogitur." The fault certainly lies in that the preliminary education of the scholars and the shortness of the school terms stand in no relation to the ambition, if not of the scholars, at least of the teachers and boards of directors. *Multa,* especially when obligatory, does not imply *Multum;* and a variety of colors does not necessarily result in harmony. Hence, some college presidents, as Eliot of Harvard, have warmly expressed themselves as favoring the abolition of required studies altogether and the substitution of optional courses.

But few of the American colleges have, in addition to their college course, one or more faculties. Four faculties, as in Harvard or Ann Harbor, are a great rarity. Some have a nominal connection with professional schools. Thus the College of Physicians and Surgeons in New York has the additional title of Medical Department of Columbia College. Likewise the New York University has professional schools which stand in practically no relation to one another. And where the bond is so lax supervision ceases altogether and neither admission nor graduation is sufficiently controlled.

The character of European universities is, as you know, entirely different. They are nearly all planned or modelled after the German pattern. England alone has preserved its peculiar system of colleges as they were evolved from the convent schools, and even France does not stand on

the same level with the rest of Europe. But if any of you should wish to find all that is worth knowing on this subject in the shortest time and presented in the most compact form—whether the information desired be of a general or of a special nature—I should recommend the numerous and authoritative articles in Kiddle and Schem's Cyclopedia of Education.

This much, however, has been definitely established as a feature of all real universities under all circumstances: first, that a preliminary education should be required for the admittance of regular students, equivalent to what is usually required of graduates of German gymnasia before they can obtain their certificates of maturity, or of graduates of the better American colleges before they can take their degrees; and that, in the second place, besides such general studies as philosophy, literature, and natural science, truly professional studies should be pursued in four faculties and with perfect freedom as to teaching and study. This latter provision insures to the student full choice as to where, what, and in what order of sequence he should follow his studies. This freedom is absolutely necessary for the well-meaning young man who is morally and spiritually self-determining. To be sure it is true that those to whom this adjective is not applicable, will in the absence of strict organized discipline languish or sink into an indifferent pursuance of bread-winning studies or into actual loafing. But the strongest natures and the best men attain their full growth only under unlimited freedom, while weak characters and bad brains will accomplish nothing under any system.

Freedom of instruction on a large scale is at home only in German and more especially in German Protestant universities. In other universities, and frequently even in those just referred to, it was crippled through religious considerations, dogmatic bigotry, and tyrannical whims. Freedom of instruction thrives neither under clerical régime nor under political absolutism. However, in spite of all attempts at suppression, the principle has remained intact that freedom of instruction and of study is a normal, necessary *sine qua non* for a university.

This postulate is also supported by the character of the preliminary education required of the candidate for a university training. This preparatory education is by preference classical. Greek and Latin are the chief subjects of a gymnasium curriculum. It may be in the very nature of the German boy or youth, or it may inhere in the mode of instruction on the part of the appointed teachers, but the fact is that the Teutonic gymnasium graduate does not always exhibit a healthy mixture of Hellenism and Latinism. How deeply rooted is the sentiment in the consciousness of the educated German classes that a classical education is a necessary preparation for a liberal university training, may be proven by the fact that the question which is frequently agitated in Germany as to whether graduates of *realgymnasia* should be permitted to study medicine, has so far always been definitely answered in the negative, in spite of the fact that according to the German trade regulations of 1869 the calling of the physician has been reduced to that of the "healing-trade." Perhaps this classical preference is also supported by the oft-repeated and hackneyed, though hardly justified saying that the battle of Sadowa was won by "the German schoolmasters," or according to another version by "the German gymnasium."

This question though, as to whether the classical gymnasium makes a better preparatory school for the university than the *Realschule* or whether they are both equivalent, has not yet been settled. The number of those is by no means insignificant who look upon the study of languages and of mathematics at a gymnasium or college as simply a method for training the mind, and who, therefore, are of the opinion that the study of *modern* languages would accomplish the same results as the study of classical languages, besides affording other practical advantages. In estimating averages where we deal with quantities not to be measured in themselves but with regard to their relative intrinsic values, we have no positive and universally applicable standard. Instruction of the same kind and grade does not always produce the same man. Not even Aristides and Cimon were alike. It is, therefore, not

to be denied that it is possible for one to be a great philosopher, humanist, sociologist, jurist, or physician, regardless of whether he had kept company with all the spirits of antiquity, or had been nursed at the plentiful breast of nature, or had obtained his schooling from Goethe, Corneille, or Shakespeare.

Besides, the latest events at the German universities are not calculated to confirm one in the impression that the study of the humanities necessarily has for its product humane youth. The brutalities of the antisemitic movement find their chief leaders on the one hand in the refuse of the ignorant populace of the large German cities and on the other in the " jeunesse dorée " of the gymnasia. The mediæval barbarity of the " hep hep " delirium is diligently practised by the young men who, as has been documentarily proven, have had the advantage of an acquaintance with Homer, Horace, and even Sophocles. Judging from the German press there is not a more repulsive class of brutes than that which loves to give itself such airs in the German auditoria and beer-houses. Unfortunately these are facts well-known to all of you. Although in the light of our more liberal institutions and our more humane manner of viewing things, they surpass our understanding. This much, however, is certain, that either Homer, Horace, and Sophocles alone will not redeem the barbarian, or that forsooth the study of the great minds of the ancient world as it has been and still is carried out in the German secondary schools is capable perhaps of stuffing the head but not of purifying the heart.

With this in mind you could not properly declare in bad taste the fact that in the requirements for admission to the Johns Hopkins University, modern languages are in certain cases considered as valid substitutes for Greek.

The president's report explicitly relates what has thus far been accomplished by the Johns Hopkins University in respect to its position on the university question. True to its principle to achieve the very best and rather to work slowly than badly, the exhaustive cultivation of the professional studies has thus far been entirely abstained from. If there is any one thing which gives the lie di-

rect to the self-conceited detraction from American aims and achievements it is this fact. Nothing characterizes the tendency of the Johns Hopkins University better than just this, that the highest value is placed on those things which cannot be directly translated into dollars. The greatest stress was primarily laid on the organization of the faculty of philosophy which was to represent what was understood in the German universities under this name before the days of the attempt to divorce from it the faculty of natural sciences. The subjects of instruction and lectures which were followed in part in seminaries after the manner of the German universities were: Mathematics, Physics, Chemistry, Biology, Comparative Anatomy,—Greek, Latin, English, the Germanic, the Romance, the Sanscrit, and Semitic languages,—History, National Economy, Logic, Ethics, and the History of Philosophy. At the same time particular attention was paid from the very start to the fact that permanent appointments of instructors should be made only with great circumspection. The appointee had to be either renowned or at least had to carry the assurance that he would make a good teacher and an independent worker. We all know to what extent each of the German universities with which we are familiar has suffered from the want of one or the other of these requirements. Here, the bearer of a great name was plunged into the greatest perplexity every time his finger happened to slip on to the wrong line of his anxiously guarded notes, or when some inquisitive member of the audience would put a modest question. In another instance it was the son of an influential professor who was made instructor at a university, *tant bien que mal* a naturalist, who very elaborately taught how many parts of carbon it would take to make one part of oxygen, etc. Again, it was some famous scientist who lacked the gift of words to such an extent that the absent readers of his thoughts were lucky in comparison with those unfortunates who needed his certificate at the end of the semester. At Baltimore this was to be avoided, and it was a long while before half a dozen chairs were finally filled permanently. But once appointed, the professors and their

assistants, as well as the extraordinary docents, were encouraged with the greatest zeal. Care was taken that none should be overburdened with too many hours' instruction. There were no limitations set on individual work. Apparatus and books were lavishly supplied. Furthermore, as in these first years the classes of regular attendance were not large, the influence of the teachers on the students and the audience was very great, and the realization of the inherent right of the university to the joint labors of teachers and students was easily brought about.

The students of the new university were in part young men who had already obtained diplomas at other institutions. Their number in these four years reached one hundred and twenty-seven. Fifty-one of these held scholarships of a kind which, to German ears, would sound very extraordinary. To be sure in German universities and academies we also occasionally have scholarships given to those of whom we think we may expect extraordinary scientific work in the future, but nowhere else can an adequate idea be formed of the wide range to which this system of scholarships was extended in the Johns Hopkins University. Here young men who have completed their course of studies elsewhere have the opportunity offered them of continuing their studies free of expense. Thus during the whole time that some of them prepare for professorships and other teaching positions, and others devote themselves exclusively to the independent and lengthy researches thus qualifying for a strictly scientific career, the university liberally pays their living expenses that they may be spared every care of gaining a livelihood. And it is exclusively scientific careers which are encouraged in this manner and only to a smaller extent the professional or bread-winning studies.

The subjects, therefore, which were especially followed by the incumbents of the scholarships were in six instances Mathematics, in six Physics, in eight Chemistry, in ten Biology, in eight Greek, in three Comparative Philology, in three History and Political Science, in four Philosophy and Esthetics, in two Engineering, and in one Mineralogy. The majority of those who had completed their course at

the university have gained appointments as teachers and professors in all possible branches, in the coast survey, in the New York Metropolitan Museum of Art, in the Fish Commission, etc., as well as in practical pursuits.

The award of scholarships is naturally left to the board of managers, which has shown itself equal to the highest expectations as regards caution, conscientiousness, and freedom from prejudice. Thus, for instance, Miss Christina Ladd, who had obtained her doctor's degree at Vassar College in Poughkeepsie, had gained great fame by her work in mathematics. She was, therefore, personally invited on June 2, 1879, by the board of directors of the Johns Hopkins University to pursue her studies at Baltimore, and to that end was provided with a scholarship of the usual annual sum of five hundred dollars.

The conditions, however, for granting such scholarships are very strict, as may be gathered from the fourth report of the president, where we read as follows: "Every candidate is expected to present his college diploma or such other evidence of fitness as may be granted by the institution in which he obtained his education. He must, besides, bring recommendations from such parties as are competent to certify to his character and erudition. He must then give an account either orally or in writing, of his past achievements and of his plans for the future and offer such proof of his abilities for literary or scientific work as would enable the faculty to pass judgment on his claims. Only in this sense are there any examinations for admission. No formal questions are offered and no definite accomplishments are expected. The candidate's merits are then considered and definitely passed upon by a special corps of teachers, by the full college of professors, by the executive committee, and finally by the full board of managers. All these precautionary measures have accomplished their object in so far that in this manner there was built up a community of unusually capable, earnest, and promising scholars, whose abilities have already gained recognition in many instances by calls to all kinds of teaching positions.

Of the other students there is required as a preliminary

for matriculation a certain sum of knowledge such as could be obtained by graduation from the most progressive colleges. While it is true that for the prosperity of a scientific institution a large number of students is desirable, nevertheless as strict an examination as possible and proof of ability for doing effective work have been insisted upon as necessary prerequisites for admission. Along with what is understood as a "good English education" and some knowledge of the natural sciences, there is required a considerable amount of Latin, Greek, and Mathematics. Instead of Greek, however, French and German may be offered by such students as intend to follow the natural sciences. Besides the requirements for the first honorary degree, which is accompanied by a diploma,—that of bachelor—are not always the same. For according to the inclinations and special studies of individual men, the greatest importance is attached, alongside of general erudition, to special subjects, such as classical studies or Mathematics, Chemistry and Physics, Philosophy, Biology, or Modern Languages.

At the beginning of the year 1880 the teaching corps consisted of thirty-three persons. Of these, besides the president, six were ordinary professors. Their names are:

President, Daniel C. Gilman, formerly professor at Yale College and president of the University of California.

Basil L. Gildersleeve, professor of Greek, Ph. D. (Princeton and Göttingen), formerly professor at the University of Virginia.

H. Martin Newell, of the University of London and Cambridge, professor of Biology.

Charles D. Morris, Ph. D. (Oxford), professor of Latin and Greek, formerly professor at the New York University.

Ira Remsen, M. D. (College of Physicians and Surgeons, New York, and Göttingen), assistant in Chemistry at Tübingen and professor in Williams College.

Henry A. Rowland, professor of Physics, formerly adjunct professor in the Polytechnic Institute at Troy.

J. J. Sylvester, professor of Mathematics, formerly in

the same capacity at Woolwich and member of a large number of European societies.

There were, besides six regularly appointed lecturers, fourteen adjunct professors and six assistants. In the year 1880 the number of adjunct professors was increased to eighteen, that of docents to twenty-two, and of assistants to eleven.

As students there were entered in the academic year 1879-1880 one hundred and fifty-nine persons. Of these seventy-nine already possessed diplomas; twenty of these seventy-nine held university scholarships. Besides these there were thirty-two regularly matriculated, and forty-eight were admitted to the lectures without matriculation.

In addition there were eighty-five auditors on the rolls, of whom twenty were teachers taking a special course in Old English;

Twenty-four teachers taking a special course in the theory of numbers;

Sixteen students of medicine registered for physiology demonstrations;

Four students of medicine registered for microscopic anatomy;

Six auditors registered for a course in comparative constitutional history;

Ten workers in the Chesapeake Zoological Laboratory and five clergymen registered for a course in the exegesis of the New Testament.

Of the students, thirty-one took mathematics; thirty-eight took physics; forty-six took chemistry; thirty-two took biology; thirty-six took Greek; forty took Latin; sixty took German; nineteen took English; thirty-nine took Romance languages; eight took Sanscrit; thirty-three took history and the political sciences; sixteen took logic; twelve took philosophy and ethics.

In the same year were given ten courses of public lectures, with a total of one hundred and one lectures and an average attendance of not less than one hundred and thirteen auditors.

These courses were on:

English poetry, with an attendance of one hundred and seventy;

French epic poetry, with an attendance of fifty-seven;

Biology, with an attendance of seventy-three;

Theory of physics, with an attendance of one hundred and forty-two;

The Italian Renaissance, with an attendance of two hundred and twelve;

The Vidas, with an attendance of one hundred and fifty-one;

Greek tragedies, with an attendance of one hundred and fourteen;

The history of philosophy, with an attendance of one hundred and twenty-three;

French literature, with an attendance of forty-seven;

The National Debt, with an attendance of forty-one.

In the distribution of cards of admission to these lectures, which do not properly belong to the kind ordinarily designated as popular, the members of the university were first considered, then teachers in public institutions, and finally the educated public.

Besides the above, special courses were given by specialists, such as courses on hydrodynamics, on the mathematical theory of the telescope, etc.

Properly speaking, there were no lectures on medicine in the professional sense. The future of medical instruction in Baltimore will have to be something far superior to what the medical schools of to-day can furnish. Thus far, the board of managers has for years been gathering the opinions and suggestions of renowned Englishmen. In conformity with the opinions expressed by Huxley, Paget, Callender, Ackland, Stokes, Savory, and others, it was decided that a long and thorough preparation of the future medical man in physiology, chemistry, biology, and laboratory work has to precede the study of medicine proper.

For if there is one professional course which more than any other stands in need of an earnest preliminary general education, it is that of medicine. In this respect the medical department occupies the same position in the Johns Hopkins University as the other special departments.

Shall I give you an idea of the sort of preparation with which our students are fitted out for the study of medi-

cine? Some years ago a speaker at the annual reunion of one of our medical schools celebrated for the wide, scholarly, and general education of its students, mentioned the fact with pride that seventeen per cent. of the students held a degree from a literary college. Seventeen per cent.! When such is the case with full-grown mountain pine what may we expect to find on the withered stump? Imagine a German faculty of medicine boasting of the fact that only eighty-three per cent. of its students are ignorant and not prepared for the course! In Pennsylvania they counted how many physicians had the degree of Bachelor of Arts. When we leave out of the count Pittsburg and Philadelphia not two Bachelors will be found on an average in each county. In one county having eighty physicians there are just two Bachelors. Not five per cent. of all those eighty thousand persons who are engaged in the practice of medicine in the United States can boast that title. Half the practitioners of medicine, especially in the country districts, are innocent of the correct orthography of their own language. A famous professor of Harvard imparts the information that very seldom does a student who has finished college with honors choose medicine for his further studies, and that this profession is chosen by those who have either passed their examinations wretchedly or not at all. Conditions have reached such a pass that no young man possessing a thorough preliminary education will enter upon the study of medicine.

It was not always thus. As far back as the last century the University of Pennsylvinia required of its matriculates Latin, mathematics, and natural science. New Jersey also had a similar law. In the State of New York a law was passed in 1792 according to which a medical student without a college diploma had to study one year extra. Even as late as 1818 the legislature of our State recognized the necessity of classical studies.

It is not necessary here to explain how it all came to pass: how the carpenter's apprentice, the tailor who had become sickly, the mechanic too lazy for work, happened to be found on the same bench of the medical school with the carefully educated, well-informed Bachelor of Arts.

Nor is it necessary to point to the fact that the medical profession has, through lack of education, fallen into disrepute almost as bad as in England where an educated practitioner is the exception; or to explain why it is that the thinking and great physicians are so few, and the ordinary follower of routine and the crude *soi-disant* specialist are so common. What I desired was only to direct attention to the cause of the trouble, and to the necessity of relief and to the fact that here also the leadership must be credited to the Johns Hopkins University for establishing the new order of things,—of admitting only well-prepared students. It is true that twenty-five years ago the University of Pennsylvania made a similar attempt, but it had to give it up. The tradition, however, has remained in the institution. For several years past it has, like Harvard, insisted on preliminary examinations in certain subjects and has stood the test successfully, which goes to show that students, like the public, are amenable to better judgment.

The two main activities of the university staff are investigation and teaching. So far there have been spent thirty-two thousand dollars for apparatus. The library consisted last year of but seven thousand volumes, but these were carefully selected and by this time their number has been increased to nine thousand volumes, the total value being twenty-six thousand dollars. Besides, a valuable auxiliary is found in the Peabody Institute, the management of which offers its facilities in that truly republican spirit characteristic of the independent thought and action of liberal men. For, in a report of the Peabody Institute we read the following: "Our library will be put to the test as never before by men of learning and their pupils who come to this city as a result of the erection of the Johns Hopkins University. We must satisfy their needs through the acquisition of books as far as it is proper for a library which is not a strictly scientific one, but which was organized for the use of the general public. It is necessary to afford them the greatest possible facilities." This truly republican tendency of smoothing the way for one's neighbor and of willingly placing one's own means at

the disposal of kindred purposes cannot be too strongly praised or acknowledged.

However, the collection of specimens of art and of natural history has just begun. In the meantime the gap must be bridged over by the proximity of Washington. But one must not imagine that collections which can be gotten at only after a two hours' journey, and that only by trains running at stated times, can be of any particular use to the great body of students. The thing they can least of all spare is time. Eating and sleeping can be reduced to a minimum, but the day has only twenty-four hours. The board of managers of the Johns Hopkins University know this well enough. If thus far there has been no buying done on a large scale, it was for reasons of economy. For till now the capital has remained intact. It is hoped that some rich townsmen, noticing the slow growth of the collections, will take the matter up and come forward with an offer of a few hundred thousand dollars or more. This is counted upon in Baltimore with assurance: it is known that there is money somewhere and its early forthcoming is expected. Civic virtue is not so rare here that its manifestation could not be counted upon with certainty. One example of this kind is known to me from personal experience. Thomas Wilson, an old inhabitant of Baltimore, died over a year ago. He left half a million dollars for the benefit of sick and poor children and especially for the founding of a summer sanitarium. A New York physician was summoned to elaborate a plan. On making the remark to the president of the board of managers that it would not be an easy matter to keep within the limitations of half a million, he received an answer which was literally as follows: "Do not be uneasy about the money. There is plenty of it still in Baltimore. Make your plans as elaborate as you think necessary and leave out nothing which may be of any use in any way whatever either now or in the future. I wish to know all your views on the matter and we shall apply them in Baltimore. There is money somewhere and we are sure to get it."

For the present, therefore, there is still much to be desired as regards libraries and collections; but then the

university is only four years old. Moreover, diligent and fruitful work is being done in the seminaries and in some of the laboratories, the chemical, physical, and biologic. Apparatus and instruments are here so plentiful and so readily provided when needed that very favorable results have been obtained, which, as regards their importance, will stand comparison with those of the old world. Researches carried on for outside purposes, such as those by Professor Ira Remsen for the National Board of Health on the parasitic contents of the atmosphere, belong to the best of their kind and in point of originality and new results obtained are far superior to the popular, almost sensational, attempts of Tyndall.

A great part of the work carried on in the laboratories, seminars, and by individual investigators is scattered throughout the periodical literature. Thus the *Journal of Physiology* published in London contains various works from Baltimore. However, in the whole country there was no appropriate periodical for the publication of the accounts of some of the work done and of certain essays. Thus the university was forced to consider the publication of journals of its own, with the result that four such periodicals are now regularly appearing. There have been published two volumes of the *American Journal of Mathematics* and of the *American Chemical Journal.* The third number of the *American Journal of Phiology,* edited by Professor Gildersleeve, is in the process of publication, while the studies from the biological laboratory so far constitute one volume. Besides the voluminous annual reports, the *Johns Hopkins University Circulars* are worthy of mention. These are published from time to time and are intended to bring before the scientists and the educated public the organization, growth, and work of this splendidly appointed institution.

In the matter of schools and of instruction there is to be noted in the republic of the United States a repetition of its experience with regard to political life. Until recently the political life of the old world rested exclusively on the abilities and potentialities of individual men or dynasties. The spiritual development of the masses was

also dependent upon these. In the republic the reverse process takes place. The commonwealth is only just formed and is developing under our eyes out of individuals; the spiritual needs are satisfied through the united activity of individuals; the public school needed no dictate from above to come into being; the higher schools owe their existence partly to individuals, partly to municipalities, at times to legislatures of enterprising States which, in their first and most important acts, endowed public institutions and State universities. The sense of interdependence is not lost in the masses when all men are equal before the law. The consciousness of responsibility towards the individual is strongly alive in the State as is the sense of duty in many of those to whom chance, or work, or both have procured many of the good things of this world. There is not a great State in the Union, hardly one of medium size, which cannot show even now, when the constitution of the United States has not yet celebrated its one hundredth anniversary, some monument of thoughtful solicitation for the public weal on the part of wealthy and public-spirited citizens. It is true that the means have not always been intelligently applied, but even in those instances where religious ardor and sect-spirit have directed benevolence and the sense of civic duty into doubtful channels we may discern that public spirit which is thoughtful of the interests of the present generations and endeavors also to labor for the generations to come. Our own world-city has furnished examples of this kind. Yet the fact must not be ignored that we are just the ones who, in comparison with our wealth, have done the least. For indeed millionaires after millionaires have disappeared into the shadowy realms without leaving anything behind them other than the obscurity of their names. When New York will cease be the city of gain and hoarding, when the character of the city will no longer be formed by the unassimilated mixture of all possible nationalities struggling for existence, then will New York also not lag behind the other cities of the Union. Consideration for moral and spiritual interests presupposes a certain quiet and composure in which this driving and surging market-

place has as yet no share. So far a comparatively small city like Baltimore has the lead on us. To be sure in a seaport and commercial city like Baltimore material interests are not neglected, but the comparative quiet of the place permits of an introspection on the part of those in whose hands large means have been concentrated. Thus, before Johns Hopkins, George Peabody had immortalized himself by the above-mentioned richly endowed institute and library. So also has Thomas Wilson, in more recent times, espoused the cause of the poor and sick children of Baltimore by leaving a rich legacy and thus benefiting not only those directly dependent on this charity, but contributing largely to the advancement of an important branch of the science of public health.

If now, at the conclusion of this sketch, we glance back over what the Johns Hopkins University has accomplished, we find that although in an absolute sense the work done is not so great, it is still relatively enormous. It was intended not to establish the institution all at once but to have it develop organically. It is as yet only in the process of this development, but the giant Roland can be recognized in the infant. The brain of the self-taught Baltimore merchant has evolved as a logical necessity and put into reality what the German universities, admittedly the best in the world, have succeeded in only partially,—namely, the fostering in the well-prepared masses of truly scientific zeal and of the highest culture based upon classical and scientific education. So far there has occurred no blunder in this development: the harmony has not been disturbed by false notes. Fortunately the board of directors is an exclusive body of simple, thoughtful, and consistent men who have the right and duty of filling vacancies in case of death or resignation. Thus it may be expected with certainty that neither will the plans of the founder be thwarted nor will his aims be frustrated. The plan of the university as conceived is magnificent. It promises to become the crowning glory and the model of American institutions, and from the way it is modeled gives one an insight into the direction in which American culture will develop. The highest culture, however, is no longer national: it is

cosmopolitan and human. Thus in the future America's best effort will equal that of Europe. Where Homer, Sophocles, nature, and philosophy are taught and recognized as the best foundation of human culture and wisdom, national barriers cease to exist. Just which will yield the best results one hundred years from to-day, whether it will be Europe or America, is uncertain enough. I have just as little faith in the decadence of Europe as in the permanent immaturity of our hemisphere. In the matter of education in the lower schools we are perhaps even now in advance of most European countries. The very results of compulsory education in the best-governed European countries leave much to be desired and allow of no comparison with those of our own public schools. While in Germany the people are taught enough to enable them when necessary to decipher their tax-bill and conscription summons, the American schools turn out pupils who, as far as ordinary business and industrial callings go, enter upon life well prepared. Both systems are necessary, both in themselves and as steps to further education. But as far as higher education goes they are not more than a step.

However, it was not my intention to make comparisons. I only wished to trace before you a simple picture of the pioneer work that was done in Baltimore in the course of but a few years and that without much clamor and pretence. The soothing breath of repose and culture permeates the modest activities of the board of directors and the diversified work of the scientists. For only those have to fuss and brag who accomplish nothing. In Johns Hopkins there is room for neither Shoddyism nor Chauvinism. If the work and development, as every one trusts it will, will continue as heretofore, there will perhaps, twenty-five years hence, be no institute in the whole world—for twenty-five years is a long time in our country—whose name will be more firmly established or better earned and whose influence on the spiritual and moral development of the best (and consequently of all) classes of the community will be more beneficial than that of the Johns Hopkins University in Baltimore.

BRAINS, CRIME, AND CAPITAL PUNISHMENT

Every individual or collective labor derives its justification and dignity from its effect. Unless there be a result, that labor is idle and superfluous, and the vital or intellectual forces bestowed on it have been spent in vain. With the intelligent and thoughtful the effect is not an accident, but a practical aim that is reached after mature forethought and well-directed exertion. The worthiest practical aim of all is the perfection of mankind. I take it that this association was founded with a view of contributing its share to attaining that end. To accomplish such a grand result no one man, society, or complex of societies would ever suffice. Not one drug, unless it be a quack medicine advertised to cure every illness of the index, is expected to meet all the exigencies, anomalies, and disorders of the human frame. Thus the health of mankind, a still more complex organism than even man, requires the co-operation of many specialists. One of them is your Society. But even your Society is a conglomerate or combination of powers. To study the pathology and therapeutics of prison existence, theologians, jurists, administrators, and medical men have combined. The latter class are accustomed to look at things and creatures from the view of their genesis. They are not, ought not to be, satisfied unless they know, or at least try to know, the why and wherefrom. Now, the anomaly of social life is the subject of your discussions in your annual meetings, has been studied from the most varied aspects. No one aspect, no one man, suffices for that purpose. Thus, what you have consented that I should present here is but a contribution to the common store accumulated for a common end.

What little I shall have to say, fragmentary as it will

be under the circumstances, I can characterize in a few words. I shall abstain from presenting any and everything that is not absolute fact. I shall refer to no literature and quote nothing. I must not discuss theories, hypotheses, metaphysics, sociology, or theology. Indeed, there is in other fields so much exact and positive knowledge on the morbid conditions which have long ago conquered your sympathies and controlled your energies, that I can safely limit myself to their sole consideration.

In behalf of those who are not quite familiar with the main points of the structure and the functions of the brain, I here present a few drawings which are destined to refresh the memory. The central nervous system consists of the hemispheres, the cerebellum, the medulla, and the spinal cord. It is composed of two kinds of tissues, the gray and the white. The gray substance is capable of independent action; it requires no external stimulus; it is the seat of the psychical functions and connects the sensitive and motory nerves. Its largest mass is accumulated on the surface of the hemispheres, which are the central organ for all mental, motory, and sensitive processes. The most trifling injuries of that part of the brain interfere with the mind, the movements, and the sensations. A slight remnant of a previous inflammation or a temporary congestion, or a small tumor, derange both mental and physical powers. The gray surface of the brain is considerably increased by the formation of so-called convolutions; they are elevations of an apparently irregular shape, which are separated from each other by deep grooves. In their irregular modulations, however, there is a great regularity. In the lower animals and in the fœtus the convolutions are but few; in man they are numerous and elaborate. Brain work develops them, as muscle efforts develop muscle. Each one, and part of one, appears to have a special function. Thus there is a local centre for the mobility of the arms, one for the legs, one for the face, one for speech, and many more. All are joined by fibres which serve the purpose of co-ordination and co-operation. All of the brain, as is also the spinal cord, is covered and protected by two layers of membranes, the so-

called meninges. One of them attaches itself more to the skull, one to the brain. Their changes, mostly of an inflammatory character, are so important, and often by their results even worse than fatal, that the mere name of meningitis shakes many a stout heart and pales many a fair cheek in the listener. My remarks of to-night refer principally to the large hemispheres and their gray substance.

Every science has its axioms which require no proof. In biology it is an axiom that the human frame is modelled upon a certain "plan." So is every rose between Shiras and the tiny garden plot of your little daughter; so is every leaf of all the countless oaks or palm trees of the globe. There is no rose, however, no leaf, that has exactly its equal. So it is with man, with every race of man; it has a certain type, but no two individuals of the same type are identities. In his structure man comprehends a number of different organs. Every one has two kidneys, a liver, a spleen, five lobes of lungs, a heart: no single one of these organs but has its peculiarities which distinguish it from that of other men. In every teaspoonful of your blood there are two thousand millions of blood cells; in your ten or twelve pounds of blood you possess almost incalculable billions. No two men have the same number. Fifteen hundred millions of men, women, and children have each a skull and a brain; not one of them is, or looks, like the other. Here is your second important axiom—viz., that Nature, while evolving her creatures upon a common plan, permits of great latitude within the boundaries of normality.

What now is, with all this variability, the underlying equality—particularly as to the human brain? And which are the requisites that establish its normality?

First. There must have been ample building material in its embryonic and fœtal period.

Second. No arrest must have disturbed its development.

Third. It must not have suffered from a disease, either before or after birth, which terminated in persistent changes.

Fourth. The composing parts of the brain must have been developed simultaneously and equally, and essential organs and functions, particularly reasoning power and will, must not be disturbed. Still, these conditions are not fulfilled equally well in all instances; if they were, there would be more uniformity, perhaps tedious uniformity. If, however, they be not complied with—within the great latitude always afforded by Nature—we have to deal with a morbid condition of either organs or functions, or, what is most common, both. Again, however, though it be ever so difficult to determine the soundness or unsoundness of functions in a given case, the recognition of health or disease of an organ is liable to be still more arduous. Many gross alterations of the brain have been known since autopsies were made, and some before; but the number of those which have been learned only by late improved methods and instruments is quite large. More accurate knowledge of the anatomy of the brain, and the study of its healthy and diseased structure with high magnifying powers, have revealed abnormalities where formerly no changes were seen at all; and we have to expect that from decade to decade many a mystery will become unveiled. Still, no matter how great the number of hitherto unrecognized anomalies will become in future, they will belong to two large classes: either arrests of development, or nutritive disorders such as inflammations and tumors.

To these two latter classes belong the local disturbances which have been found in the brains of criminals, such as atypical, supernumerary, or defective convolutions and abnormal grooves between them. By some men of great learning and high standing, such as Benedict and Lombroso, they have been denominated criminal brains. They claim that "the brains of criminals exhibit a deviation from the normal type; and criminals are to be viewed as an anthropological variety of their species, at least among cultured races. The constitutional criminal is a tainted individual, and has the same relation to crime as the epileptic to convulsions. The essential reason of abnormal brain action is abnormal brain structure. The appreciа-

tion of these facts is likely to create a veritable revolution in ethics, psychology, and jurisprudence."

I cannot go so far as to believe in a special type of criminal brains. Crime is not an entity, an absolute and well-defined manifestation of the same kind and tendency; it is as manifold as human instincts or tendencies in general. The latter are no less manifold in perversity and depravity than they are numerous in the average condition of life and health. Indeed, the same changes which have been claimed for crime are those of insanity. Insanity is the field in which crime may grow; alleged crime, which landed the perpetrator in the State prison, proclaims itself quite often as insanity after a brief prison life; crime that was punished by death penalty has been proven to have been insanity in its physical manifestation on the autopsy table. Such facts go very far to intimate that crime is apt to be insanity plus its dangers to society.

Amongst criminals a great many anomalies have been observed. They refer mostly to the shape and structure of the head and brain, and to the functions of the system of circulation. The head of criminals is more often found brachycephalic than dolichocephalic (more short than long). The prognathic shape is quite frequent. The eyebrows and the underlying arches of the frontal bones are often excessive, the bones in general are thick, the occiput is oblique—symptoms all of which are found in the famous paleontological skull of the Neander valley (and claimed by Lombroso as criminal type). In robbers the head has been found large, in thieves small. That much is certain, that, in criminals, either large heads or very small heads have been met with. The anterior part is poorly developed; asymmetry of the head, and disproportion between head and face, and of single parts of the same and of other parts of the body, are numerous. The occiput is often flat, the hard palate narrow or flattened. The forehead is reclining, wrinkles of the covering soft parts being quite frequent. Hair and beard are often scanty, the nose irregular and inclined to one side, the lips large. The eyelids are in close proximity to the nose, the iris pigmented

or defective (coloboma), its color varying in the two eyes, the pupils not centrally located. The nails of the fingers and toes are malformed, so are the genital organs and the feet; clubfeet are frequent; goitre and rupture are often found. The veins are frequently dilated and the vascular system is found defective in its function. Thus in many, contrary to lay expectation, blushing is not infrequent; tobacco is not tolerated, alcohol not by some. Irritable heart, neuralgic headache, dizziness, fainting spells, convulsions, partial paralyses are frequent occurrences.

Many of these anomalies however, are met with among non-criminals. Still, when there are many of the kind in the same individual, we must not forget their connection with, and dependence on, the condition of the nerve centres. Face and head, their structure and expressions, are under the influence of the brain even in the adult; physiognomic doctrines have a certain sound basis in these facts.

The direct causes of cerebral changes are either structural and primary, or such secondary alterations of its form and function as are produced by the effects of distant nerves or complexes of nerves. I must not, however, weary you with facts which may appear to you to belong to the sphere of the medical man only—though, indeed, whoever has brain himself may well desire to know its structure and its dangers—but my theme demands that I should at least mention the principal causes of alterations of the brain and of its functions. So I refer to injuries; to inflammations and hæmorrhages; to tumors, solid and cystic, the latter resulting from hæmorrhages or from the invasion of certain worms; to abscesses; to diseases of the blood vessels; to certain nerve diseases of a severe type, such as hypochondria, epilepsy, St. Vitus' dance, and hysteria; to affections of the senses which result in hallucinations; to changes in the nerves of the surface which result in insupportable maddening itching; to the diseases of the intestinal tract (the small pinworm has been known to produce mania); to the diseases of the heart that influence the circulation of the brain; to the changes in the life of woman which alter her nature, not only by raising

it to its full perfection, but also by exposing her to the deleterious, because to her too revolutionary, influences of pregnancy and confinement; and also to the effect of sexual excesses.

In the interests of intelligibility I shall have to return to the consideration of a few of these factors in order to become perfectly clear to those whose studies lie in different directions, and because what is to the anatomist and physiologist a subject of scientific interest only, to the physician an important question referring to the nature, causation, and preventive and curative treatment, that is to the jurist a problem of responsibility and irresponsibility for a criminal act, and to the citizen and humanitarian a problem of the preservation and humanization of society. As far as the jurist is concerned, his, at least, theoretical points of view are identical with those of the biologist. A sound medical jurisprudence inquires into the condition of the person committing a crime, with the following questions: Was the criminal, when he committed the act, matured both in years and intellect? Was there not an arrest of cerebral and thereby intellectual development such as idiocy? Were there chronic diseases of brain known to produce psychical diseases? Were there degenerative, mostly hereditary influences affecting the ethical faculties? And, finally, is the criminal person subject to transitory disorders which are apt to make their appearance in long or short intervals, the former sometimes extending over years? On one or several of these factors depends the determination of the presence or absence of the freedom of will, which comprehends two faculties on the part of a person: first, that of recognizing the nature and consequences of his actions, and of the necessities of law and order and of the consequences of his transgression; and secondly, that of associating ideas and premeditating a decision.

Disturbances in the nature and the function of any vital organ do not always require grave causes. Slight changes in circulation, particularly when they persist, are sufficient to create an irritation. The higher an organ is in the vital scale—for instance, the brain—the more readily will it submit to essential alterations.

Every cause of brain irritation may lead to permanent changes—mostly of an inflammatory character—and to abnormal cerebral action. That irritation may be due to the effects of poisons floating in the blood or to changes in nutrition. The latter may be defective; lack of blood leads to gradual emaciation and inanition. But the most frequent changes are congestions, mostly chronic. Every disease of the centre of circulation, the heart, is liable to thus derange the brain. Many of the insane in our institutions have become so in consequence of heart diseases. I knew such a man who was at the head of several kinds of business, changing from one to another, wayward, irritable, and flighty. He often complained of headache and consulted me for it. I found the cause of his headaches and perverted brain action in a chronic heart disease; at that time he saw spots and sparks, could not lower his head without increasing his symptoms, had to sleep on three or four pillows, and was dizzy. In his business transactions he had been for some time rather incomprehensible, but his relatives were slow in believing that his condition might lead to insanity. There never was such a complaint in the family; why should he develop one? Gradually he become violent; occasionally there was a street fight, now and then unprovoked attacks on friends and strangers, trials for assault and battery, and conviction with penitentiary. From the penitentiary he was sent to the insane asylum, where they soon said they cured him of his now acknowledged insanity. But of the cause of his insanity, his heart disease, he was not cured. When he was discharged "cured"—that is, when he was again forced into the hubbub of daily life—he soon had a relapse. An attempt at murder, which, if it had been successful and the man not formerly been recognized to be insane, would probably or possibly have carried him to the gallows, was again the cause of his isolation in a lunatic asylum.

Injuries to the head, by blow, fall, or otherwise are frequent causes of mental disturbances and criminal acts. The works on forensic medicine contain plenty of cases in which the gallows cured the diseased brain. Beck relates a case of injury to the head, periodic insanity, and

murder. The treatment of the case was a death sentence. He has still another case of injury of the skull for which the man was trephined. He became insane, committed rape and murder, and the surgical treatment was continued by a court of justice—he was executed. In another case, after violent death by the hand of the law it was found that a whole half of the brain was wanting—the law or the court lacking all of it.

Esquirol reports the case of a child who fell on his head when three years old. Since that accident he suffered from headaches, until, fourteen years afterward, he was taken with mania. In the *Alienist and Neurologist,* 1883, page 646, Brower treats of the question of murders and crimes after injuries to the head. An injured man was sentenced to be hanged in spite of good expert testimony. He was not hanged, however, but only because he had an opportunity to commit suicide. Friedreich has a similar case where a man was decapitated because a horse had injured his skull and brain. T. Guder reports eight such cases, six of whom were sentenced to suffer death.

I knew, and treated a part of the time, a boy of eleven years who fell from a tree. He was immediately taken with convulsions depending on hæmorrhages from ruptured blood vessels. After a few hours he was paralyzed on one side. While his paralysis was slowly improving, the inflammation produced by the irritating clot in his brain brought on furibund attacks of mania with attempts at murder, and finally epilepsy. They gradually relaxed under treatment, until nothing was left but a moderate degree of paralysis.

Under the influence of poisons, mostly organic and often medicinal, psychical diseases and anomalies are quite frequent. High temperature of the blood disturbs the nutrition and function of the nervous system, as of the rest of the body. Chills, deliriousness, convulsions, acts of violence, or suicides are but the various expressions of such physical changes. The typhoid-fever patient who jumps from a window or commits a murder is as irresponsible as the one with confirmed melancholia or an acute insanity. A jury would easily be convinced that a fever patient who

commits murder must not be sent to the gallows, but what about those whose acute disturbance becomes chronic, with the same ethical and social results? Scarlatina and typhoid fever, even in the child, may lead to permanent insanity. Rheumatic fever is liable to produce inflammation of the brain membranes, on which headaches, paralysis, convulsions, and temporary or permanent insanity may depend. Not only the mental aberration following a clandestine birth, but also the toxic influence of the puerperal state, out of or in wedlock, give rise to child murders. Some of the murderesses are treated for their *crime* and recover in their sick-beds, some are cared for and possibly recover in an insane asylum, others are treated in a court of doubtful justice and may expiate their malady on the gallows or in the State prison.

All medicines which influence circulation in general, and particularly that of the cranial cavity, are liable to seriously disturb the functions of the brain; foremost amongst them memory, judgment, and will power. The doses in which such medicines will have such untoward effects are not always the same. Thus a cautious physician is rather more apt to prescribe, at least in the beginning, too small doses than too large ones. For there are idiosyncrasies in persons who bear but trifles compared with the toleration of others. Opium, and more so nightshade, thorn apple, hyoscyamus, and Indian hemp are apt to excite the brain into perfect irresponsibility. The case of a young woman I have published was one of the kind. She took in one dose a quantity of Indian hemp which had been prescribed for a number of days. When I entered the room she was in high glee, radiant and excited, dancing around her kitchen stove on the top floor of a tenement house. On the stove was her baby, roasted. The medicinal exaltation wore off in a single day; it took prolonged pains, however, to save her from criminal prosecution. Other powerful remedies when used internally are ergot, iodoform, oxide of carbon and the sulphide of carbon of the india-rubber works. Cocaine, chloral, chloroform, excess of bromide, also act by their influence on the nervous system.

Some twenty years ago I was careless enough to attempt

an operation on, and give chloroform to, a patient, a man of thirty years, all by myself. We were alone in a third-story room. He was docile enough while beginning to take the anæsthetic; but during the stage of excitement he jumped up, became violent, and attempted to throw himself out of the window. My efforts to restrain him resulted in a continued struggle, during which I was at a great disadvantage. For days I was laid up, and for weeks exhibited the marks of the combat. If he had murdered me then and there, the probability is that he would have been found, perhaps in a sound sleep, very likely without any trace of chloroform about him. There would have been nothing in that room but a dead man, a live man, and the evidence of a struggle. I have often asked myself whether the man would have had much of a chance to escape the gallows if I had not been muscular enough to protect both myself and him.

The acute effect of the poisons mentioned by me, chloral, chloroform, and cocaine, is but seldom immediately dangerous to society, though it be to the individual. But slowly, silently, and positively they so influence the cerebral substance and the circulation that functional disorders must be, and frequently are, the results. As long as the individual suffers, but individual harm is done. If there be an infringement upon the social equilibrium the condition is called a disease, when the physical changes resulting from the foreign influences are read through the bones in which the brain is concealed; when not so recognized it is called an unmitigated crime. Acute lead poisoning leads to sleeplessness, hallucinations, and acts of violence quite like those of delirium tremens produced by alcohol, which has filled by its many criminal exhibitions the annals both of hospitals and of the courts of justice. It is only acute alcoholism, however, which is to be considered here, for it is only *its* transgressions produced by hallucinations, and its complications with epilepsy and epileptiform affections, which come strictly within the limits of my subject. Still the chronic physical effects of alcohol predispose to acute outbreaks. The former are bodily changes, consisting of irritation and inflammation of the liver, the kidneys, the

heart, and the brain. Socially and physically they show themselves in mental tremor or torpor, in indolence and idleness, feebleness of will power, mendacity, tramping, and thieving. Thus alcohol is æsthetically as ugly as socially dangerous. The acute outbreaks, attended with acute congestion and subacute or acute inflammation, are frequently the subjects of investigation before courts of justice and of the pleadings of lawyers. For the motives of the alcoholic murderer are weighed in different scales. Responsibility and irresponsibility are the war cry of the opposing parties. The fact is agreed upon that here is a person who has a diseased brain; here is an act of violence that cost the life of a better man, perhaps, than he; here is the question whether he is to be killed as he did kill; also the question whether society or state, with a *sound* brain, will have to commit the same act performed by the man with the *unsound* brain. It is true that the brain becomes unsound by excesses of its own. These excesses, however, have various foundations. They may be the results of whim, vagaries, and levity; or of hereditary disposition; or of habit acquired in an ill-advised sickness; or in the cares and sorrows of a man not able to drown or overcome them otherwise. Many of our alcoholics are as much sinned against as they are sinners; and the electrical death-chair is no cure or retribution, any more than Maine liquor laws are preventives. There are very much more efficient prophylactics. There is a story of a liquor dealer who had a theatrical man assaulted because, since he performed, men would not frequent the bar. That story is suggestive of preventives. They are theatres, museums, places of recreation, and exhibitions. In most cases the lack of other stimulation is the incentive to the enjoyment of, and excesses in, alcohol. Permit an honorable stimulation which at the same time is recreation, weekdays or Sundays, and there will be less tedium, less temptation, and less sin. Both the lecture room and the church will be visited more by those who spend part of a holiday in a museum than by those who are allowed no better entertainment than the ginshop.

Syphilis is a frequent cause of diseases of the nerve

centres, with all their consequences on motion and sensation, on intellect and will. I speak of it here because it is a calamity, like every other disease, and not always the punishment of excesses or of sin. Indeed, the worst forms we medical men meet with are those in the newly born, or such as are contracted by medical men through a wound in their hands inflicted during the treatment of the sick. The cerebral changes produced by syphilis are frequently quite sudden. Both the membranes and the brain substance with their blood vessels become abnormal. The former becomes thickened and adherent. There are vegetations on the membranes in the ventricles, and in the blood vessels local softenings, indurations, abscesses, and tumors. All these alterations are a permanent danger to mind and to soul, to physical and emotional force; for treatment is quite often futile. Like the changes in the membranes of the bones and the iris of the eye, which, when they are established, remain perceptible for all time, the material changes in the cranial cavity result in impairment of the memory, depravation of the character, loss of ethical feeling, dizziness and headaches, depression or excitement, deliriousness or stupor, melancholia or mania. Persecution mania is quite frequent under these circumstances, with its tendency to either suicide or homicide, or both; so is melancholia with remorse and self-accusation. I knew a middle-aged man who had quite a reputation in New York as a street preacher twenty-five years ago. He edified his audience by the public confessions of his own sinfulness and by his tearful implorations for their sympathy and prayers. After these daily exercises he would go to what was called his home and maltreat his wife and children. While so employed he was arrested and sent to Blackwell's Island. His condition was correctly appreciated, and a protracted treatment with mercury and iodine cured him of sinfulness, both alleged and actual, and of his brain syphilis, and of street preaching.

Most of the cases of abnormal brain function, leading to insanity and possibly to crime, which have thus far been enumerated, are those of the adult. There are, however, just as many causes of anomaly which strike at an

earlier time. Indeed, while man experiences many things which shape his nature and fate after he is born, so there are as many while he is being born, and still more before he is born.

Let me explain: The day on which a child is born is but the last of a great long number which frame its future existence. Indeed, on the changes which take place in the born infant within the first nine months of his life we are apt to look with awe and wonder; still they are trifling when compared with the evolution, within the nine previous months, of the specks of combined pseudoplasm which are destined to be shaped into a human being. The organs which give the attributes of superiority to the animal, and particularly to the human animal, develop most rapidly, viz., the nerve centres. Now, wherever rapid development takes place, there is ample opportunity for morbid alterations. We speak of the tendency to pathological variations whenever the physiological developments is exceeding its average; in plain language I should say, where there is rapid growth, there is a tendency to overgrowth; wherever congestion of blood is required in the interest of development, there is danger of excessive congestion, and inflammation. So daily experience teaches us that exercise of a muscle contributes to its increase, over-exercise destroys its function by injuring its structure. Now, the rapid growth of the several organs of the embryo is not always uniform: the very organs which are mostly nourished and mostly in active demand suffer most. Thus it is that heart diseases in the newly born, depending either on an arrest of development or on inflammations, are quite frequent; thus also that the right side of the fœtal heart, which has the principal work to do before birth, is mostly affected, while in the adult most diseases of the heart are found on the left. The brain, while growing rapidly, and because of this, is the subject of many inflammatory diseases. They either lead to changes in its substance or to its partial destruction. Thus it is that many a baby is born that looks absolutely normal, while inside there is an absence of perhaps the most important parts. Between the absence of part or parts of

the organs and their perfect formation, however, there are ever so many stages and forms of development. As there are varieties of height and looks and faculties in the adult, so there are thousands of varieties of brain evolution, some more normal, some more abnormal, all with their varieties of functions, intellectual, moral, and emotional.

Not in all cases does the fœtal brain work out its future shape and destiny all by itself in its cranial capsule. In many, particularly those in which the abnormal growth begins at a very early period, the defective evolution is also perceptible in the skull. Brain and skull grow simultaneously. When the former remained small, or when, what is more common, the large hemispheres are but slightly developed, the skull adapts itself to the brain. It is quite common that in such cases the bone is quite thin, evidently because there was a scantiness of building material all around, like a house with thin walls and incomplete interior. The result can easily be estimated, though you never saw a case: a small head, with thin bones, open sutures like those of the normal child, reclining forehead, and the appearance and the soul of an idiot. This class of so-called microcephalics are helplessly doomed to idiocy.

Another anomaly which interferes greatly with the physical, intellectual, and moral condition of the human being is one which shows itself in the preponderance of the bone. Imagine a fœtal or infant brain of normal shape and size; it requires for its rapid growth plenty of space and support. Now, normally the bones are separated from each other by soft, yielding ligamentous tissues which ossify about the fifteenth or sixteenth month after birth. They sometimes, however, ossify before the child is born; then the brain is locked up inside, cannot grow, the convolutions of its gray substance are compressed, the blood vessels are hampered, the ventricles encroached upon. The result is, besides difficulties during birth, a hopeless idiot. Or select a case in which the premature ossification takes place a month, or four months, or eight months after birth. The sooner it takes place

the worse for the child; hopeless idiocy, hopeless epilepsy, stupidity, hebetude, gross animality, are the unavoidable changes in the mind and character, parallel with the earlier or later occurrence of premature ossification.

The same forms of disease which are prevalent in the born are found in the unborn. Their results, however, vary with the period in which they occur; they are the worse, the earlier. As a disease in an embryo cannot be reached, treated, or stopped, it runs its full course. No congenital chronic thickening of the brain membranes, no fixed changes in the brain substance, unless it be syphilitic perhaps, have ever been cured. Thus it is easily understood why there is that legion of absolutely hopeless, or sickly, or incompetent, or irresponsible beings amongst us. They were tainted and doomed six months before they saw the light.

Thus becomes evident what I said, that the path of man is strewn with dangers before he is born. You will see also that it is not necessary to resort to maternal impressions as the cause of physical, intellectual, and moral anomalies in the offspring; that theory may safely be left to the nurses and poets.

The dangers to the body and mind incurred through and during the process of birth are also many. The very means to save mother and child may become a danger to the latter. The application of the obstetrical forceps—one of the most beneficent instruments invented in the service of mankind—is a frequent cause of lasting injury. The blood vessels of the fœtus and infant are very thin and rupture easily; more frequent than hæmorrhages outside the cranium are those inside; slight traction or pressure is sufficient to burst a blood vessel, with the result of a persistent injury to the functions of the brain; thus are brought about paralysis, mostly of one side, and incompetency of the intellectual faculties. Thus the very means of saving the new life may, under unfavorable circumstances or in clumsy hands, be the cause of rendering it a burden to itself, its parents, and the community.

Nor is that all. Forceps or no forceps, in the course of natural birth the condition known as asphyxia is a

frequent occurrence. With incipient life there is sudden death, or apparent death. The newly born is expected to greet its existence with a cry. That cry is eagerly expected, but not heard; the lungs do not act; the heart is feeble, perhaps not audible. The absence or retardation of circulation makes itself felt everywhere. Hundreds of small hæmorrhages may be found in the interior of the whole little body; the brain will exhibit them in large numbers; or a large amount of blood will burst through a perforated blood vessel, or the blood will merely clog in small ramifications, and thus a normal nutrition becomes impossible. Again the same result: persistent injury to the brain and its functions; again the possibility of epilepsy, paralysis, idiocy, stupidity, clumsiness, or waywardness, and depravity for a lifetime. Half a minute, more or less, before the baby utters its first cry may forever decide the fate of that baby, body and soul. Now you will find it explainable, too, why it is that serious illness of both body and soul, physique and character, are so frequently the unfortunate gift of the first-born. For it is with the first-born of young parents that both forceps operations and asphyxia will most frequently occur.

Not always will the cases of this kind be absolutely hopeless; in a number a disposition only will be created to mental feebleness or irritation.

Predisposition is not always, however, the result of primary brain lesion or malformation. For instance, in the adult it accompanies certain occupations and callings: mental aberrations are frequently met with amongst brain workers, from over-irritation; lead workers, from poisoning; prisoners, from remorse, dreams, unsanitary surroundings, and such hereditary tendency as landed them in the prison walls; prostitutes, from exposure, syphilis, and mostly from alcohol.

Strong predisposition is created by mental contagion. They call it suggestion nowadays. As a single case of hysterical convulsions in a female hospital ward may provoke hysterical convulsions in all or most of the inmates, so in a single family, where surroundings and influences

are the same, different or like forms of insanity make their appearance in two or three members of the family at the same time. The epidemics of insanity and murderousness of whole populations—the persecutions of the Christians, of the Jews, of witches—are of that nature.

A few years ago (1888) Paul Aubry wrote on the contagiousness of murder. With him the great causative factors are heredity and degeneration. The latter, according to him, depends largely on education in its widest sense. He charges the public press with producing crimes by its constant sensational reports of murders and other crimes, which excite the imagination and, by the persistent parading of an example, lead to imitation. Thus are brought about not only individual murders immediately after the committal of a single murder or after the decapitation of a criminal, but also the acts of cruelty during political revolutions, such as remind one more of absolute insanity than of mere barbarism. With Aubry, prevention is based upon the same opinions. It consists of a sound moral individual hygiene, of the moralization of habits and customs, of proper regulations of the press reports, and of more logical consistency in the acts of severity on the part of the courts of justice.

Criminal acts are often committed by persons who were known to be quiet, law-abiding, and industrious. Now, with our notions of right or wrong, of responsibility and irresponsibility, such cases require and meet with the full retaliation of the law. If, however, we look into the merits of such a case, we frequently arrive at unforeseen results. An outbreak leading to crime is as little the outcome of nothing as a sudden lightning or a tornado. On the latter we take no revenge; we only try to protect ourselves against their return. Indeed, if most of the unexpected and unexplainable criminal acts were fully studied, they would be recognized as the consequence of physical changes, and frequently of periodic insanity. Our lunatic asylums are the recipients of many such. Periodic insanity, in which a brief attack may occur after intervals of months or years, is quite common. Many are retained a short term and then reported cured be-

cause no symptoms of insanity have made their appearance for some little time. Thus the statistics of the institutions exhibit many alleged recoveries which actually are but temporary interruptions of the mental disorder. The superintendents are to be blamed for it in many instances. They ought to be held responsible for the harm done by the patients whom they restore to civil life with its duties, rights, temptations, and excitements. Still, they are not the only ones to be held responsible. For many of these unfortunates are torn away from their restful seclusion by those who mistake a hospital for a dungeon. I have taken the liberty of calling these people who are constantly attacking the walls of retreats with habeas corpuses and mandamuses, philanthropoid cranks. They appear to suffer from a monomania of their own, and ought to be held responsible for the harm they are doing. The dangers of such premature or unauthorized deliveries are very great; from time to time the daily press reports acts of violence, and murders committed, by men immediately after their forced discharge from an institution which hitherto protected both them and society. Lucid intervals in established melancholia and dementia may last years; particularly is that so in those cases which depend on the peculiar anomaly of the functions of the gray substance of the brain which is called epilepsy. It exhibits itself in sudden attacks, not only of convulsions, but of stupor or of epileptic seizure. It is then diagnosticated in a consultation of twelve citizens, who can afford to swear that they know nothing about the case and have no opinions on it, and is finally treated by the hangman. Not infrequently there is no premonitory symptom and no apparent cause. Sometimes the electrical condition of the atmosphere, the influence of the sun and moon, the changes of the barometer, an intervening disease such as influenza, emotional disturbances, or any other cause, give rise to a crisis. The diagnosis as to either criminality or morbidity is very difficult, particularly when a murder is to be judged, as to its merits, years after the occurrence, It is just such cases as prove to the understanding of everybody that insanity is not a constant, invariable, or

typical condition. Doubtful conditions are very frequent. The frequency of such doubts has induced the Germans to establish the principle of a partial responsibility—a very awkward attempt at not solving the problem—while with us the battle of the gallows and the temporary or perpetual restraint is fought by both the exhortations, pathos, and gesticulations of zealous attorneys and the contradictions of opposing and partisan so-called experts.

Nothing is more apt to convince us of our insufficiency and short-sightedness and liability to blunder, and to render us very cautious indeed, than the fact that what is called an act of insanity by some men and some codes of law is called a crime by others. In the State of New York we punish attempts at suicide, perhaps not those which are the immediate results of feverish excitement during brain fever, typhoid fever, pneumonia, or influenza —for in such cases the dependency of mental disturbances or physical disorders is readily recognized; but those in which even the most experienced eye does not always observe the physical foundation of an irresponsible act, and punishment is meted out without stint, are very numerous. Still, in many of them an organic disease can be found; for instantaneous despair and despondency do not easily get the better of the instinct of self-preservation. Chronic meningitis in all its forms, with adhesions between the membranes or between the membranes and the brain; chronic induration of the tissue from inflammation, obstruction of blood vessels, changes in the blood vessels or in the brain substance itself, of syphilitic origin, are often found. Our old acquaintance, and new scourge, influenza, yields a number of cases of mild or severe aberration of the mind, from mild melancholia and debility to violent attacks of maniacal fury. Thus we exhibit the brutality of punishing the chronic results of typhoid fever, of previous sunstroke, of heart disease, of vascular changes, of influenza. And we call ourselves children of the nineteenth century, good citizens, Christians, humanitarians, philosophers, and what not.

Physical derangement of distant organs are frequently predisposing causes. The ill-humor and intractable tem-

perament of dyspeptic and costive people are proverbial. Why is it that indigestion and ill-humor are closely connected, though there be no irritating pain? Because gastric disturbance diminishes the introduction into the system of nutrient material, and deprives the brain of its normal amount of food and healthy stimulus; because it generates gas in the stomach, prevents the normal movements of the diaphragm, and thereby hampers both heart and lungs; and because it irritates the ramifications of the pneumogastric nerve, which through other branches controls the heart and its functions. A full meal on a healthy stomach renders its possessor more genial, generous, and humane; a full meal or one hastily swallowed into a dyspeptic organ makes its tenant peevish and morose, and adds another disciple to the school of Schopenhauer. Why is chronic constipation a frequent cause of hypochondriasis, melancholia, and insanity? Because it renders more sluggish the abnormal circulation, not only that of the intestines, but also that of the liver and the stomach and the vast domain of the peritoneum; because it irritates and ill-nourishes the terminations of the splanchnic nerves; and, finally, because it generates noxious gases, which are not expelled, but are absorbed into the circulation and act as systemic poison. That is why a medical ancestor proclaimed that "*Qui bene purgat bene curat.*"

I almost wish, though you may not, that I had six evenings instead of one. For the mutual relations of the body and the soul are more taken for granted than understood, and in the interest of the problem before me I should very much desire to convince every one of the direct and close dependency of intellect, will, and ethics on the shape or misshape of the body. Let me allude to but one example. Why are most hunchbacks ill-natured, spiteful, and malicious? Certainly not because they are deformed and ugly and therefore exposed to derision. For persons with grotesquely crooked, rickety limbs or ludicrously ugly features are just as much exposed, and still quite often are placid and good-natured. Nor is it that they are embittered by the long suffering they had

to endure before their malformation was finally settled upon them. For, indeed, long-continued pain and intense suffering are more frequently a cause of resigning submissiveness than of malevolent rebelliousness. It is because the abnormal shape of the spine, though not even interfering with the structure and function of the cord, compresses the lungs, interferes with the heart, dislodges liver and spleen, and thus deranges sanguification, circulation, and digestion.

Insanity cannot always be recognized with ease. Particularly those instances which terminate in criminal acts are difficult to fathom. The most extraordinary ones are often those of transitory insanity. It is mostly attended with outbreaks of ferocity. Murders are frequently committed in such attacks; they are quite often, as I have said before, the first symptom, and may look premeditated. For an insane person is not abnormal in all his functions. His will may be absolutely gone, his impulses are no longer controlled by his intellect, and still his reasoning powers may for long periods be quite or nearly intact. The belief that an insane person can be easily recognized as such, and that he is always insane, is a great mistake. Does a consumptive cough and wail without interruption? Are there, or are there not, years or months or days where no symptoms betray him; are there, or not, even in the advanced stage, nights without sweats, days without cough, pain, and anxiety? Are there, or are there not, confirmed rheumatics and gout-stricken men who are well for weeks and months, and still never without their foe always present? Are there, or not, those suffering from diabetes twenty years, until it makes its last call; who once a year, or a few years only, have an attack of boils, or local gangrene, or digestive disorder, and are quite well in the intervals? Is there, or is there not, malaria in the blood, and sure to break out in a chill, though the sick has uttered no complaint to-day? Not everybody discovers the truth; it takes a good diagnostician to see a disease when apparently absent; and the microscope of the mind cannot be read by a jury.

As a person inflicted with insanity is one affected with

brain disease, which may or may not be concealed by the solid, immovable, silent skull, the difficulty of its recognition can be understood when you recollect every complexity of the faculties and actions of the brain, and consider, for instance, that even in the abdomen, which is so much more accessible to all sorts of tests and the seat of so much simpler affections, often either the opening of the cavity in the living, or an autopsy, is required to ascertain the nature of the trouble.

Functional disorder always means structural change. Insanity with its results is no fault of the character, no passion, no depravity, any more than typhoid fever or a surgical accident. It is no sin, as which it was maltreated only fifty years ago, but a malady. It strikes the just and the unjust, the religious and the infidel, the rich and the poor, the sinful and the virtuous, those who have spent their time and efforts on their depravation, like those who toiled decades in honorable pursuits in the service of the community.

How long it may take to either appreciate or recognize the insane condition or criminal tendency, and their connection with each other, the following case may elucidate.

Thirty years ago I attended a baby boy for tubercular meningitis. He was one of the few cases I have ever known not to die of the dread disease. In his family there was no instance of either tuberculosis or nerve disorder. Some years afterward, however, a girl was born who developed mild epilepsy when growing up. The boy was apparently healthy in after-years. At school, however, he proved an incompetent scholar, besides being obstinate and occasionally violent. With these traits of character and mind, obstreperousness, laziness, and wilfulness, he grew up, neglected studies and business, behaved quietly enough at times, became now and then violent, and sometimes maliciously so, in the public thoroughfare, and was considered queer and incalculable by his family and friends. My advice to treat him as insane was not heeded, though it was readily admitted that the brain disorder of his early infancy was the cause of his waywardness. The suggestion to confine him in an insane

hospital was received with derision and considered an affront. If at those times he had committed a murder, I dare say that the plea of insanity would have been welcome to his attorney, but a jury would hardly have been found willing to accept it. Meanwhile, he lived with his family or amongst strangers. One summer afternoon, when in the country, he suddenly seized a heavy missile, after having threatened several times to kill his brother, and, firing it at him, barely missed his head. If the intended victim had been a stranger and been killed, the decision whether the murderer was to go to the lunatic asylum or to the gallows would have been difficult and doubtful. Fortunately it was a member of the family. Then at last they consented that the son and brother was insane. He has been in an asylum since, and will not leave it.

Once, perhaps thirty years ago, I was summoned to call upon a man who was said to be delirious. Was he a drinking man? No. Had he been sick long? No; but he had neglected his work for some weeks. So I went. Upon entering I was attacked by a stalwart man arrayed with an iron poker, but escaped uninjured to the street. I reported the case as one of probable insanity to the police of the district, and was kindly advised not to visit a man who evidently did not want me. A year afterward I learned that after many acts of violence, none fortunately fatal, he had been declared insane. Then also I learned that the man, formerly industrious and mild-mannered, had suffered from an attack of sunstroke years previously; had complained of headaches now and then, but had never been so aggressive as when he selected me for his victim. If he had succeeded in fracturing my skull, without for a month or two giving other proofs of insanity, the possibility at least, aye, the probability, is that an unprejudiced and untaught jury would have sent him to the gallows.

In May, 1891, a man was sentenced to ten years of hard labor in Lübeck, Germany, for seventeen burglaries committed in the course of a number of years. He was known to have been confined in a lunatic asylum several

times. The case was referred to two experts, both medical directors of large insane institutions. One was certain the man was insane and irresponsible, the other—a man of ripe years and great experience among ever so many thousands of insane—insisted upon absolute sanity and responsibility on the part of the prisoner. The court sided with the latter testimony, and the man was sent to the State prison; not for a long time, however, for he had to be transferred to the insane hospital as a hopeless case before many months had elapsed.

You all remember the case of a medical man who, after poisoning a man, killing his wife, stealing a will, forging another in the interest of himself, committed suicide in his cell. Here was a murderer, plain and simple, a murderer for the sake of personal gain, who, moreover, appeared to prove his guilt by committing suicide. Would any jury in the land have thought differently, and was there a possibility of his escaping the gallows? I think not, and thousands were grieved when they heard of his self-inflicted death and his escape from proper punishment. There may be many here who shared that opinion and grief. A post-mortem examination was made by some of the most competent and most honorable medical men of the country. Dr. H. M. Lyman, of Chicago, reports in his name and that of others: "At different points the membranes that cover the top of the brain contained patches of inflammatory thickening and exudation. There was adhesion of these membranes to the cortex of the brain. These patches were places where the membranes were thickened so they looked as though they were coarse patches sewed on or fastened on to the natural and healthy portion of the brain. This denoted inflammation of the membranes, and would cause derangement of the mind, and, in many cases, would lead to insanity. It was one of these cases of slowly developing mental disorder, produced by sunstroke in India years before." The dead murderer had been in the East Indies as a medical missionary.

Many mental diseases—that is, aberrations of the reasoning and will power—offer much difficulty, because

for if a mistake must be made it ought to be on the plea of leniency, not of cruelty. Still, society is often endangered by acquittals.

Though the diagnosis of a case of impaired brain function be very difficult, and often impossible, still the morbid condition exists. Explaining is more difficult than hanging; therefore, hanging has become less with the increased facilities for explanation.

The word "crime" is not a term which means the same. Centuries ago they persecuted and killed for crimes that did not exist. Many of the alleged crimes were virtues, like the Christian faith fifteen centuries ago. Many are deemed aberrations in one country, crimes in another, like suicide.

With the variability in the definition of "crime" that of responsibility and irresponsibility must vary. There is but one thing fixed, that is the relation of causes and effects, the correlation of physical causes and mental and moral symptoms.

What we have most to fear is that even in our time, while punishment still means retaliation or retribution, we are in constant danger of not recognizing the physical cause of misdirected cerebral action called "crime." The grossest errors have been committed in that respect. If only one mistake were made in a hundred convictions and death sentences, society could not afford to make that mistake. You and I may blunder, but the State cannot afford the brutality of capital punishment as long as the convicted criminal is anomalous. Our civilization, as represented by the law of God and man, has ceased to crucify Christians, burn Jews and witches, torture and violate women and children; it is satisfied with guillotining, axeing, hanging, or electrocuting the anomalous and the diseased. Aye, we are expected not to be surprised if even members of the most humane of all the professions, could be found to participate in the discussion of the advantages of one mode of official killing over another.

Human society, as represented in the State or the Nation, has the right and the duty to take care of all its members, the sick and the well. The person addicted to

suicidal tendency must be protected against himself as surely as the poor sick must be cared for at the public expense. The man with such ethical defects and impaired will and intellect as to prove dangerous to his fellows must be prevented from doing harm or repeating his acts of violence. The well have rights also. No pardoning power of any commission or governor can ever restore a brain to norm or health. The possibility of a complete return to norm or health must not be accepted as proven except after a long time and upon protracted scientific inquiry. Until they be so established, the place for transgressors is in a place of safe-keeping. The murderer has seldom if any chance of being cured, and ought to be isolated forever. But let us have done with killing. Let us see to it that the new century may have no reason to look upon our short-sighted barbarism, as we review with painful awe the centuries of the torturer and the witch-burner.

REPORT ON CAPITAL PUNISHMENT

Capital punishment has engaged the attention of all classes of men, in and out of office—citizens, lawyers, clergymen, legislators, and philanthropists. It has gradually, under ordinary circumstances, been restricted to such persons as have taken the life of a fellow-being. Those in its favor allege the propriety of retaliation, which, among so-called civilized men, becomes the exclusive privilege of the communities, and justify their position by referring to the Bible and the dictates of religion.

Those opposed proclaim their respect for the sacredness of human life under all circumstances, deny the right of the State to destroy it, and protest against the community's imitating in cold blood the example of the very murderer whom it execrates for his brutality and cruel cowardice; they point to the degrading influence of executions, and also refer, as their justification, to both the Bible and religion. Thus capital punishment is both condemned and authorized by religionists, for the same reason that slavery, but thirty years ago, was both justified and censured.

The questions engaging the attention of this Medical Society of the State of New York are always scientific; they are practical only so far as they are dependent on and based upon science. No matter what any of our members believes or acts upon as a private citizen outside this hall, and outside the legitimate labors of his professional life; no matter what his political party allegiance is, or his creed and religious belief, here we are neither lawyers, nor legislators, nor retaliationists, nor religionists. Thus your Committee does not propose to ventilate the question of capital punishment, or its perpetuation or abolition, and the subjects connected therewith—viz., the nature of crime, of responsibility or irresponsibility, of the

cerebral functions called judgment and will, the existence or non-existence of a free will and its limitations—from any other but an anatomical and physiological, that is, scientific, point of view. Your Committee holds that no questions but those strictly scientific and conducive to the hygiene of mankind have any right before your forum. What we must principally avoid is the reference to metaphysical speculations, such as that of one of the greatest minds in history, Spinoza. He maintains that "in the mind there is no such thing as absolute or free will, but the mind is determined to will this or that by a cause which is determined by another cause, this by yet another, and so on to infinity." Nor must we allow ourselves to be swayed by an opposite consideration of Huxley's, who contests that "theft and murder would be none the less objectionable were it possible to prove that they were the result of activity of special theft and murder cells in the gray pulp." Objectionable! That they certainly are, for they are anomalies in themselves and disturbers of the equilibrium of social and moral economy. Objectionable they were, both the theft of a sixpennyworth when it was punished on the gallows as late as this very century, and that which is forgiven or mildly reprimanded by a humane judge of our time. More than merely objectionable is the murder of a fellow-being, whether it is expiated on the gallows, or buried in an insane asylum, or condoned by wire-pulling powers, or justified on the plea of self-defence.

Crime is the result of an evil impulse which ought to have been controlled. The controlling powers are the cerebral functions of judgment and will. Whoever is held responsible for their aberrations and his wrongdoings is termed, and punished as, a criminal. Whoever is considered irresponsible is no longer a criminal to be punished, but a lunatic against whose vagaries society takes pains to protect itself. Indeed, among civilized people, both the punishment of the criminal and the incarceration of the hopelessly insane are, or ought to be, but different modes of self-preservation. By them the theory of revenge and retaliation has been given up long ago. Their minds

are more bent upon the preservation of the physical and moral health of the community than on the spiteful annihilation of the rebel against the common welfare.

The question of responsibility or irresponsibility is a very grave one, both theoretically and practically. The assumption of the adage "no free will exists" would explain and excuse and defend everything either friendly or inimical to the interests of society and the rights of the individual. Still, many high in science and literature and philosophy defend it.

Benedict,[1] one of the best known and deservedly famous physiologists and pathologists of the brain, comes to the following conclusions:

"The brains of criminals exhibit a deviation from the normal type, and criminals are to be viewed as an anthropological variety of their species, at least among cultured races.

"The constitutional criminal is a tainted individual, and has the same relation to crime as his next-of-blood kin, the epileptic, and his cousin, the idiot, have to their encephalopathic conditions.

"The essential ground of abnormal action of the brain is abnormal brain structure.

"The appreciation of these facts is likely to create a veritable revelation in ethics, psychology, and jurisprudence."

So it will, though not every crime be dictated by disease, and because the interests of the commonwealth require protecting and saving.

Responsibility and irresponsibility have but uncertain boundary lines. These cannot always be determined. They depend on a great many factors, which may be fixed or changeable, stationary or transitory. The education of the young, no matter what his cerebral substance or general physical constitution, works only by influencing and changing his brain structure. Disturbances of the health of the body, and particularly of the brain, may either terminate in restitution to the normal estate quickly and easily, or with difficulty and late, or no recovery takes

[1] "On the Brains of Criminals," Vienna, 1897.

place at all. This difference in the result may depend on the severity of the attack on a congenial disposition which need not assume the significance of a malformation, but shows itself only in differences in the power of resistance on the part of the cells or organs in the individual bodies; in the same way in which an infectious fever destroys the one, injures the other, and leaves the third intact and immune.

These varieties of structure, disposition, and of powers of endurance and resistance are very interesting. There are many anomalies in the nervous system which tend, according to circumstances, either to recovery or to faulty developments. Such are the predispositions, recognizable in infancy and childhood, to neuralgia, nervousness, melancholia, misanthropy, eccentricity, dudism, hysteria, hypochondria, inebriety, convulsions; the tendency to cardiac, vascular, and vaso-motor irregularities, such as palpitations, fainting spells, vertigo, sudden congestions to brain and face. They are neither diseases nor crimes, but they may lead to both. Favorable or untoward influences determine the development of a hypochondriac into either a famous humorist who makes ten thousands of sturdy men smile through tears, or a homicide who sends a shudder through men and women; or a boy suffering from congestive headaches may develop either into a heart-moving and soul-stirring poet or a raving maniac. For normal growth and exaggerated overgrowth are but two different results of the same vascular action.

The adult man or woman is the result of hereditary and congenital structure and disposition and a thousand influences of mental or physical nature. The former are but nominally different from the latter. Education is but the shaping of the brain by impressions, the consequences of which are physical, no matter whether they are permanent or transitory. When the former, they impress even the features of the face; deep must be the delineations in the nervous centre which are permanently photographed outside. Thus there are educational crimes like social crimes. The formation of the earliest habits is the determination of the character of the man. The dime

novel, which spoils the taste and fires the imagination, is as certainly a source of infection as the exhalation of a sewer. Paul Aubry wrote in 1888 on the contagiousness of murder. With him the great factors in inducing it are heredity and degeneration. The latter, according to him, depends largely on education—in its widest sense. He charges the public press with producing crimes by its constant sensational reports which excite the imagination and lead by the persistent parading of an example. Thus are brought about the acts of cruelty during political upheavals, such as remind one more of insanity than of mere barbarism. His prophylaxis is based upon the same opinions. The preventions of the contagiousness of murder consists in a sound moral, individual hygiene, in the moralization of habits and customs, in proper regulations of the press reports, and in a more logical severity of the courts of justice.

Many of the physical changes which lead, or can lead, to criminality are preventable. The servant girl who lets a baby fall may maim it for life, or may so effect the brain as to change the current of thoughts and feelings into criminality. The development of a syphilitic infant into either a healthy man or an invalid, or the luckless possessor of a cerebral endarteritis or gumma, with their physical or moral consequences, depends on the diagnostic knowledge and the therapeutic agents of the practitioner. It is he who may be the intellectual father of the criminal. The obstetrician's clumsy forceps, or improper use of forceps, has frequently injured both head and brain. The prolongation of asphyxia in the newly born gives rise to thrombosis, hæmorrhages, and secondary encephalitis; to paralysis, idiocy, epilepsy, or insanity. Thus a few seconds more or less, thus obstetrical knowledge and dexterity more or less, may decide the fate of the newly born, his physical, intellectual, and moral health or invalidism, and his whole future forever. Or, contemplate a few large rachitic heads a few years old, after the disease has run its full course. Their circumference and shape are probably the same; ossification has been completed for some time, and no great alterations will ever take place. In all of them

rachitis was mostly cranial and cerebral. One has attained a normal development; one has developed an unusual amount of brain in the vacant space, and the vascular irritation has added to its vitality and evolution into the growing genius; the last is a confirmed hydrocephalus with its future semi-paralysis and idiocy. Why these differences? Why—in one case the condition was recognized in time and treated judiciously; in the other some domestic absurdity of diagnosis—difficult teething—was furnished by the ignorant mother and meekly accepted by the medical man. Thus the same big head may mean either perfection or incompetence, and it takes more than a jury of fellow-citizens to decide what is going on inside.

Psychical diseases or anomalies, both acute and chronic, are frequent under toxic influences. Infectious diseases in their acute stages give rise to acute attacks quite often. Scarlatina, typhoid and puerperal fevers, poison the blood and impair cerebral action by the mere circulation of the ptomaine, though there be no complication with meningitis at all. Even in children, insanity, both maniacal and melancholic, has often been met with in and after infectious fevers. Many of the child murders during the puerperal stage were the results of puerperal infection. Opium and the other narcotics—belladonna, hyoscyamus, stramonium—result in depraving both the judgment and will power. Ergot sometimes, more frequently iodoform, oxide of carbon, and the sulphide of carbon of the india-rubber works, act in the same way. And alcohol? The delirium tremens and its many criminal acts fill the records of both the hospitals and the courts of justice. Still more dangerous, because more numerous, are its chronic effects. Its ethical depravation equals its æsthetical ugliness: mendacity, feebleness of will power as bad as physical tremor, idiotic torpor, and the delirium of jealousy and violence, the habit of idleness and tramping, thieving, and outrages of all kinds, are the mottoes inscribed on its flag. Acute lead poisoning leads often to the same symptoms as that of alcohol—sleeplessness, hallucinations, and violence like those of delirium tremens; and its chronic influence leads to results resembling those of progressive paralysis. Your

Committee merely mentions cocaine, chloroform, chloral, bromides, to remind you of the many external influences which may slowly, silently, and surely so alter the cerebral substance as to result in functional anomalies which, if understood, if recognized through that mute and hard cranial shell, as what they are, would be called diseases; when they are not they are called crimes.

The anatomy and physiology of the brain are greatly under the influence of the heart. Many chronic and some acute cases of dementia can be explained in this way. It is always the chronic class which is more dangerous, because it is more difficult to notice and guard against. In many of them atrophy, hypertrophy, or congenital smallness; in others, adiposity or fatty degeneration, or stenosis of the aorta with is consecutive cerebral anæmia and ill nutrition, or the obliteration of the pericardium; in very many the incompetent mitral valve with its retarding influence on the intracranial circulation, is a cause of insanity or insane actions. The latter precede the recognition of the former a long time. A man whose name was prominently mentioned in connection with the New York dynamite affair was repeatedy before the courts for assault and battery and attempts at murder, before his condition, appreciated and predicted by a member of your Committee, was finally acknowledged.

The diseases of the brain whose influence on, and connection with, mental and moral diseases is undoubted are either local or general. In many no other symptoms could be discovered; in others the intellectual and moral anomalies were complicated with other symptoms. To that class belong tubercles, which are quite common to demented persons; syphilitic changes; abscesses, either from emboli or atheromatous degeneration; neoplasms of different nature, and multiple sclerosis. Very frequent is apoplexy, either from vascular incompetency or traumatic. A boy of eleven years, under the observation of the Chairman of your Committee, fell from a tree and had convulsions which lasted for hours until hemiplegia set in. While his paralysis was slowly improving he exhibited furibund attacks of violence with attempts at murder, and finally

epilepsy, all of which improved after several years, leaving a moderate degree of paralysis.

Of the diffuse affections of the brain we shall only mention inanition from physical causes and from overwork and anxiety, and exhaustion from excesses, insolation, trauma, and other causes of hyperæmia and meningitis. Here belongs periencephalitis, which may begin slowly with physical symptoms, or with mania and hypochondriasis. Senility is a frequent cause of mental disturbance. Unfortunately the symptoms of most of these conditions may resemble each other very much; delirium, mania of all kinds, mainly persecution mania, puerility, irascibility, diffidence, misanthropy, are just as many symptoms of both acute, subacute, and chronic forms. Epilepsy is a frequent cause of outbreaks of unexpected violence. This peculiarity gave it the name of propulsive epilepsy. Many criminal acts are the positive results of epilepsy, and many epileptics were cured on the gallows. At this moment a negro is under trial for a murder. He is known to have severe attacks of epilepsy. Experts have sworn he is a criminal. Experts have sworn he is diseased and not responsible. What does it teach? It teaches that there is surely reason for a doubt as to the causation of the criminal act. It would also teach that society as represented by the jury, and society as representing the humane spirit of the times, ought to keep a sharp lookout to its own dignity. Man may blunder, but society cannot afford to be brutally mistaken where it is at the same time accuser, judge, jury, and executioner.

The malformations of the male sexual organs, mainly anorchis and diminutive development of the penis and testicles, predispose to mental degeneration with its consequences. One of your Committee knows a man of thirty-six with infantile organs and no trace of hair on the pubes. In spite of repeated warnings not to expose himself to utter failure, he attempted cohabitation. When alone with his partner he grew moody and desperate, becoming more than ever aware of his incompetency. In his rage at rendering himself ridiculous he attempted to strangle the woman; she finally succeeded in saving herself and deliver-

ing him to the police, which landed him in a penitentiary. Masturbation and emissions produce melancholia and mania; in milder forms depression, despondency, and moral obliquity. It is again the class of masturbators which furnishes part of the disgusting tribe addicted to sexual perversion, such as pæderasty, sodomy, and homicidal mania. Nymphomania I have not mentioned because its complication with homicidal mania is but rare. But the influence of the great developmental periods, puberty, and the climacteric age, in the production of moral morbidity, is well appreciated.

Great difficulty in deciding the nature of a criminal insult is experienced in cases of periodic insanity. It is these cases which are received in lunatic asylums, retained for a short time, and then discharged cured to exhibit favorable statistics or are freed by the philanthropoid cranks who mistake a hospital for a dungeon. The dangers of such premature or unauthorized discharges are great indeed; the daily press reports from time to time homicides and murders committed by men who ought to be protected against themselves and prevented from doing harm to others by being locked up for life. Intervals between acute attacks of mania or melancholia may last years; particularly, cases connected with epilepsy come suddenly like a flash. Moon and sun, terrestrial magnetism and the electrical condition of the atmosphere, climate, telluric exhalations, intervening disease—be it only influenza, wounds, or other debilitating influences of short duration—are apt to give rise to violent outbreaks. In such cases the decision as to whether the accused was a criminal or a sick man when the murder was committed is very difficult, or even impossible. Years after the occurrence the diagnosis of the case must be attempted. The history of previous cerebral disease, of *petit mal* or full-grown epilepsy, neuroses and fainting spells, eccentricities, hallucinations, possible heredity, will be told with more or less significance. These are the very cases which prove unmistakably that insanity is not always typical and constant in its nature. Doubtful conditions are very frequent. And in the face of these facts a jury is expected, under the

spur of one attorney and the derision of the other, to find a verdict of responsibility or irresponsibility. These are also the facts which have induced the Germans to establish the principle of a partial responsibility.

When a crime is made the subject of investigation, the perpetrator ought to be subjected to the closest study. The action of an engine is not estimated or calculated without considering the shafts and wheels and boiler; but the changes of judgment and will are weighed too often by the so-called common sense of the illiterate or semi-educated. No matter whether Benedict and Lombroso are right or wrong, these facts are incontrovertible. You meet too large heads, too small heads, asymmetrical heads—such as you find so very often in epilepsy and idiocy—asymmetrical faces, disproportion between skull and face and their single parts; also disproportion between other parts of the body, excessive length of extremities, big mouth, overgrown tongue, the roof of the mouth too much arched or too flat, and the teeth irregular; the top of the head or the occiput flattened, hare-lip and cleft palate, heavy lower lip, deformed ears, and different colors of iris. There may be the retracted nasal insertion and the shortened base of the skull of the cretin or semi-cretin, or early neurotic symptoms—such as hysteria, chorea, epilepsy, night terrors, and tachycardia.

Suicidal tendency with the result of repeated attempts at self-destruction is but rarely the result of instantaneous despair or despondency. In many cases the actors in that drama had an organic disease—among them leptomeningitis in all its forms, sclerosis, syphilis, embolism, gray degeneration, adhesions, and cysts. Acute and isolated attacks are often the results of fever in pneumonia, pleurisy, meningitis, typhoid fever, or influenza. And these are, in part, the cases which are thought worthy, not of the hospital, but of the penitentiary.

Conclusions.—There are many causes of the perversion of judgment and will.

Those causes which are physical are either congenital or acquired. When acquired, they are so either by the progressive development of hereditary or congenital dis-

position, or by intervening diseases, or by the impairment of cerebral evolution through bad training, example, and social influences.

The variety of causes, both anatomical and functional, is such as to render an exact diagnosis extremely difficult. The sworn opinions of experts are quite often contradictory. Cerebral anomalies and lesions are very often not accessible to our methods of investigation.

When there is any doubt in an individual case of crime in regard to either responsibility or irresponsibility, it is safer to take the alleged criminal to be diseased and morbid than to declare the sick to be a criminal.

In many cases the innocent and the anatomically sick have been subjected to capital punishment. On the other hand, dubious cases develop full-grown dementia soon after the criminal proceedings.

The knowledge of such occurrences is part of the reasons why juries are averse to rendering the verdict leading to a death penalty, and why but a small percentage of murderers are ever sentenced among us, and why so many are set free to become permanent dangers to the safety of the public.

Human society and the State, while they owe protection and safety to all, must make no mistake, unless it be in the direction of leniency and humanity.

The medical profession must not allow mistakes to be made which can be prevented. This Medical Society of the State of New York—having the advantage of physiological knowledge, and being aware of the difficulties of being always correct and of the absolute impossibility of making a positively safe diagnosis in every case of alleged crime or presumable cerebral disease or anomaly—expresses its opposition to the perpetuation of capital punishment and its hope that means will be found to protect the community by less uncertain and less inhumane methods.

A. Jacobi, M. D., New York,
Chairman of the Committee.
William C. Wey, M. D., Elmira,
B. F. Sherman, M. D., Ogdensburgh.

THE PRODUCTION OF DISEASES BY SEWER AIR

The composition of sewer air is at least as variable as that of sewerage. According to Henry R. Kenwood (*Public Health Laboratory Work,* Philadelphia, 1893, p. 232) its reaction is generally alkaline. Oxygen is variously diminished, according to the efficiency of the sewer ventilation; it is sometimes in normal proportions. Carbonic acid is variously increased from the same cause; it probably does not average more than twice the normal amount. Ammonia, sulphureted hydrogen, ammonium sulphide, and carbon bisulphide are present in small quantities. Marsh gas is small in amount or absent. The fœtid and putrid organic vapors of sewage are, according to Odling, allied to the compound ammonias, and are probably carbo-ammoniacal, and contain traces of ptomaines and leucomaines (*i. e.,* animal alkaloids). Moulds, fungi, and bacteria (chiefly bacilli) and their spores, together with animal and vegetable débris, appear to constitute almost the entire suspended matter. Micro-organisms average about six per litre in the air of a good sewerage system.

The atmospheric air always contains bacteria, mostly, it is true, dead, and mineral parts. The presence of pathogenic germs has been denied; but there *must* be some in the air, and living ones too, for contagion, unless it result from immediate physical contact of the sick and the well, must take place through the air. Tubercle bacilli are found on the walls of rooms; before they enter the lungs of inmates, they must be carried through the air with other dust. It is true, they have been found there but rarely; but von Eiselsberg claims to have seen *Streptococcus erysipelatos* (Langenbeck's *Archiv,* vol xxxv, 1886) and Pawlowsky *Pneumococcus Friedlander* (*Berl. klin. Woch.,* No. 22, 1885). Indeed, the general statement of

Tyndall, not contradicted, always reaffirmed (*Essays on Floating Matter of the Air,* New York, 1882), that the apparently purest air contains dust with micro-organisms, makes the frequent presence of pathogenic organisms at least probable.

But the atmosphere is certainly no favorable medium. Germs are heavy and fall to the ground; thus it is not unreasonable to believe, but it can not be proved, that a walking child of two feet in height may inhale them more readily than an adult whose respiratory inlet is more than five above the surface. The dryness and light of the sun destroy them; even micrococci die in sunlight in a few hours (Duclaux, *Microbes et maladies,* p. 34). It is only when locked up that spores were found normal after many (twenty-five) years. Koch retained virulence in his tubercle bacilli five or seven days in diffused light, but only a few minutes or at most hours under sun rays.[1]

Indeed, pathogenic bacteria have a hard time of it. They live in high temperatures only, and die soon in a low one; they are readily destroyed in water containing saprophytes or any other non-pathogenic bacteria. In the thoroughly soiled water of the River Seine, at Paris, which holds no oxygen, there are no pathogenic bacteria; while a few miles further down, near Meudon, the Seine contains again both oxygen and pathogenic bacteria. Hence, sewage is not a promising place for them to thrive or live in. Great dilution destroys them or renders them innocuous. For two thousand years Rome has emptied all its fæces and other refuse into the Tiber, and no impurities of a dangerous character were detected by Celli and Scala a few miles below the city.

Now, what is valid for air outside a sewer is so for that inside it, with this difference, that there are more germs found in the atmosphere than in sewer air. Billings states emphatically that there are fewer micro-organisms in the air of sewers than in that of the streets. He quotes

[1] The statements occasionally made that *Achorion Schönleini,* plasmodia, erysipelas cocci, also tubercle and typhoid baccilli, and vibrio choleræ may undergo multiplication in the air, lacks confirmation.

Carnelly and Haldane (*Proceedings of the Royal Society*, London, 1847, p. 51), who report that the London and Dundee sewers contain twice as much carbonic acid, three times as much organic matter as outside air, and fewer micro-organisms, and remarks that this air in the sewers is better than in naturally or even mechanically ventilated schools. It is only when there is splashing in the sewers that (temporarily) there can be more organisms in their air. Otherwise moist surfaces do not give them off. It is only under favorable circumstances that they can be carried off and upward into the houses and escape through ventilating shafts. Into living rooms they could escape only either where there are no traps, or where the traps are empty either from disuse or from being sucked out or from upward pressure. In this way, Billings suggests, pyogenic organisms and Fehleisen's coccus appear to be conveyed through house drains.[2] At all events the opportunity for microbes to get out of the dwellings is greater than to get into them. When they get into the drains from inside, they are flushed out. It is evident, however, that the flushing out of substances entering the sinks from inside depends on the structure and size of the drain, the nature of the trap, and the amount of the water poured through it, also on the use or non-use of disinfectants employed in the households.[3]

Less rainfall, and consequently less flushing of sewers, gives rise to accumulation of more filth. Badly constructed brick sewers have the same result. Outfall sew-

[2] The epidemic of enteric fever in Croydon, 1875, was attributed by Buchanan to the entry of infected sewer air into houses through untrapped drains and openings into the drains. The pipe sewers were of small size, six or nine inches in diameter, and were ventilated at distances of a hundred and fifty to two hundred and fifty yards by petty openings which were blocked by charcoal trays.

[3] The quantity of refuse from rooms and houses is very large indeed. Pettenkofer calculates the daily amount of fæces for the average person at 90 grammes, of urine 1,170 grammes; for a thousand persons per annum, fæces, 34,000 kilogrammes; urine, 428,000 litres. If you add to that figure 159 litres of water daily for each individual, the sum total of daily sewage for a

ers terminating below water are apt to be choked. Thus, while Russell's analysis yielded a fair standard of purity of sewer air, Parent Duchatelet found only 13.79 per cent. of oxygen and 2.99 per cent. of sulphureted hydrogen. Thus gas is undoubtedly developed to a great extent, bubbles are constantly breaking on the surface (Frankland on The Transport of Solid and Liquid Particles in Sewer Gases, *Proceedings of the Royal Society,* April, 1877), and may enter houses through *untrapped* drains *whenever they are not permitted to leave the main sewer otherwise.*

Under these circumstances, as the specific germs of infectious diseases may be contained in the liquid disseminated by the bursting of bubbles, sewer air may certainly become specifically infected. Some of the germs may find a favorable medium in the organic material, the ammonia and the phosphates of sewage, while others are more liable to be destroyed by the saprophytes of putrefaction. As to typhoid, the cases are very numerous. In regard to cholera Parkes refers to its introduction into Southampton in 1866, where it was probably due, in his opinion, to the passing of pumped sewage, infected with cholera evacuations, in a frothy and agitated condition along an open conduit. He adds the remark that, as soon as the latter was covered over, the epidemic (or rather endemic) abated. The latter remark is suggestive. A sewer disconnected from houses by good traps is no longer an open conduit; and it appears that *unless sewer air is forced upward,* no amount of cholera bacilli or toxin will annoy the population of houses properly secured by traps and by ventilating shafts both in the houses and in the streets.

But granted that sewers are infested with bacteria, how do they get into the air of sewers, of streets, of houses?

thousand persons is 160,000 litres. That explains in part the wrath of Andrew Fergus, M. D. In the *Proceedings of the Medico-Chirurgical Society of Glasgow,* of October 2, 1868, he broadly states that water-closets and canalization are opposed to revelation and Bible, that they are contrary to Nature, inasmuch as they rob the soil, are the sole cause of pollution of rivers, and fill the sewers with noxious gases which enter the houses in spite of traps.

PRODUCTION OF DISEASES BY SEWER AIR

Mr. J. B. Berkart (*British Medical Journal,* November 25, 1893) claims that, in the usual conditions in which defective drainage is supposed to exert its baneful influence, it is impossible that pathogenic micro-organisms which may exist in an untrapped pipe or in a cesspool can escape into the air. The force of evaporation is not enough to lift from a moist surface an organism, however small it may be; and even powerful ascending currents of air can not convey from a dry and porous soil, much less from a cesspool, any germs. Consequently, from untrapped pipes and cesspools nothing but irritant and toxic gases can escape.

He experimented through six or eight hours with currents of air at a velocity of from twenty-two to forty-five miles an hour. They did not lift into the atmosphere a micro-organism from a putrid solution of extract of meat of not more than a half per cent., or from putrid urine, and were unable to detach a micro-organism from any such putrid solution as may have been allowed to dry on the walls of a glass vessel or on wire gauze.

The question whether any and which diseases can be produced by the inhalation of sewer air has engaged the fears of a great many and the attention of a number of observers. A careful contribution to the literature of the subject is that of H. Hun (*Medical News,* August 20, 1887). He admits the absence of proof of a direct infection by sewer gas, but has quite an array of cases of ailments and diseases attributed to it. Anorexia, constipation, vomiting, diarrhœa, and coated tongue are frequent; prostration, drowsiness, headaches, small pulse, delirium, clonic and tonic spasms, fever, chill, and coma, intercostal neuralgia, Bright's disease (though in a person of sixty-five with arteriosclerosis, and another of sixty years); poliomyelitis in a patient of twenty-nine, who never recovered fully, and of forty-two who recovered after two years; also enlargement of the spleen, with albuminuria, are among the observations made in persons exposed to the exhalations of sewers or cesspools. It will be noted, however, that among all these cases there is not one which can be traced with the knowledge we now possess to a specific germ.

Mark Style (*Lancet,* October 19, 1889) attributes cases of acute pemphigus to the inhalation of sewer gas. Two children of five and of two years lost color and felt drowsy for a fortnight, then developed blebs on feet and shins; new attacks occurred on other parts of the body (no erythema with it). There were fever and anorexia. The sewers were found to be badly constructed and leaky; when they were mended the children improved.

Hæmoglobinuria in a child of eight years, "probably due to the inhalation of sewer air," was observed by Gordon Sharp and William Summerskill (*Lancet,* December 9, 1893). The girl lived in comfortable circumstances, was previously in good health, fell sick with dyspnœa, puffy appearance, and frequent micturition, which resulted, however, in six ounces daily only of a chocolate-brown urine the sediment of which rose to the top. Guaiacol and ozonic ether gave the characteristic blue color. There were no casts, only a trace of albumin, but few blood cells, much amorphous hæmoglobin. Convalescence began in three days, hæmoglobin disappeared after the fourth day, and anæmia remained behind. In the dwelling the water-closet pipes had been leaking, and the smell had been disagreeable. The pipes were being changed, and the smell was worse when the attack came.

It appears, in the opinion of the authors, that sewer air affects young children quite rapidly, and noxious vapors are known to produce hæmoglobinuria, but it is claimed that no previous case like the above is known.

In the experience of Dr. A. H. Smith, the president of the Climatological Society, in 1881, a large number of the attendants in St. Luke's Hospital, New York, were sick with tonsilitis. Examination showed that the brick sewer which ran beneath the building had fallen in in many places, and the sore throats ceased when iron pipes were substituted for the brick sewer.

The same gentleman communicates to me the following facts:

At Elberon, N. J., in the latter part of August, 1891, occurred a series of eleven cases of sore throat within a

period of eight days in the summer residence of one of the most prominent of the cottagers at that place.

The first person attacked was the butler. He complained of great soreness of the throat and severe headache, but continued for two or three days to wait upon the table. When first seen there was intense congestion of the tonsils and fauces, but no membrane, and no exudation at the mouths of the tonsillar follicles. There was little or no swelling of the throat, and no enlargement of the lymphatic glands. The character of the throat lesion remained the same throughout the attack. The temperature never exceeded 103° F. There was extreme lassitude and severe aching of the bones. This, which was the severest case, lasted about ten days, the dysphagia being the most prominent symptom to the last.

In rapid succession ten other inmates of the house, including several guests, exhibited similar symptoms in varying degrees of severity; in two of the cases the throat lesion was that of follicular amygdalitis of a mild type. In the other cases there was simply a dusky redness of the fauces, and some degree of pain in swallowing, lasting from three to six days.

It was discovered, as the result of a sanitary inspection of the dwelling, that a bath-tub on the third floor had been for some time disused, and that the trap had become dry, permitting direct communication with an old cesspool, the existence of which was not known. No other plumbing of the house discharged into this reservoir, and there was no offensive odor from it.

No communication of the butler with any source of infection could be traced, but the negative evidence on this point was not conclusive, as unconscious exposure could not be wholly excluded.

The bath-tub and its connections were removed, and the house has been occupied for two seasons since without the occurrence of further trouble.

Earlier in the same summer a group of four similar cases occurred in a house about half a mile from the one just mentioned. The first patient was a young lady, in

whom the throat lesion was similar to that of the butler already referred to, but with the difference that the throat was extremely painful even when at rest, and the dysphagia was so great that the patient could scarcely be prevailed upon to take even the smallest amount of nourishment. The fever in this case was moderate, and there was no aching of the limbs.

Three other cases occurred in the house within a week. One of these showed well-marked follicular inflammation; the other two only engorgement of the mucous membrane, chiefly venous in character.

Examination showed that the main waste pipe, which ran under the house for nearly the whole length of the latter, was of clay, and was broken in numerous places. The soil along the whole length of this pipe was saturated with sewage. An iron pipe was substituted, and the contaminated soil removed and replaced by dry sand. No sickness has occurred in the house during the two seasons that have succeeded.

Owing to special reasons, there was absolutely no intercommunication between the persons constituting these two groups.

One of the latest contributions to the same subject is a book on the combat with infectious diseases by Brix Pfuhl and Nocht (*Die Bekämpfung der Infectionskrankheiten*). After discussing the necessity of access of air to a sewer, to prevent it from getting putrid and giving rise to bad odors and dangers, they say on page 310:

"The transmission of infectious diseases by sewer gas has not been proved by past researches and may be considered as out of the question. But bad sewer air can produce nausea, headache, and malaise (when its effect is persistent), and may become one of the causes of other morbid symptoms. To the workmen employed about sewers the preservation of pure air is of paramount importance. Thus successful aëration has a great hygienic importance.

"Investigations referring to the health of men employed in sewers had negative results. They do not suffer more than the average population from infectious diseases.

"Only those employed in the sewers of Wiesbaden suf-

fered from rheumatic complaints more than other public employees. This was due to the fact that the Wiesbaden sewers, carrying off the water of the hot springs, have a constant temperature of 25° C. or more, thus exposing the workmen to frequent colds. Thus their rheumatism depended on circumstances not at all connected with sewers or sewer air."

To my mind the assumption that throat disease and sewer air must be connected with each other is probably due mostly to the irritability of the fauces. Pungent odors and tastes are not tolerated, chloroform can not be administered to a sleeping person because of that circumstance, and strong gases produce cough and discomfort. Hence irritation, hyperæmia, and catarrh may well be explained by the contact of malodorous and sharp gases with the vulnerable mucous membranes of the throat, particularly of children, but specific germs and toxines are, unfortunately, not malodorous, not pungent, and not irritant locally. Indeed, it is in this that lies their principal danger.

Compared with the frequent endemical occurrence of sore throats under the apparent influence of sewer exhalations, which is suggested by some of the reports, I am permitted to make use of a report made to H. M. Biggs, M. D., Chief Inspector of the New York Health Department, by A. Clinton, M. D., Inspector. The report is a very careful one, and the one thousand cases of throat affection detailed under the heading of pseudo-diphtheria, which occurred, or rather were reported, from August 1, 1893, to April 1, 1894, in the city of New York from the Battery to East and West One Hundred and Twenty-fifth Street have been accurately located on large city maps. The principal conclusion to be drawn from these two maps, kindly intrusted to me by the Health Department, for whose co-operation in the preparation of this paper I am thus greatly indebted, is this, that to the best knowledge and belief of the experts of the health department the occurrence of throat disease, particularly false diphtheria, is in no way connected with sewers, open sewers, leaky sewers, or outlets of sewers. The same conclusion must be drawn—I may say that just

here—from two other maps placed at my disposal which prove that there is no connection in New York city between diphtheria and sewer air in any shape or form. In the latter instance there can be no doubt whatsoever, as the reports of diphtheria cases must be supposed to be correct.

There is, however, some evidence in the practice of every medical man and in public statistics that sickness in general, and fevers—mainly typhoid—coexist with the accumulation of excreta and other refuse material, though no infected water be drank. Definite amelioration has invariably followed their regular removal. The facts carefully collected by Dr. Buchanan in his *Ninth Report of the Medical Officer of the Privy Council* prove a considerable lowering of the death rates by such amelioration, particularly in typhoid fever. The same result has been obtained from the same cause (*i. e.*, improved sewerage) in a number of cities—such as Salisbury, Bristol, Carlisle—where the sewers are ample and well ventilated.

He asks: "Why is it that some cities, like Chelmsford, Penzance, Worthing, and Morpeth, with ample sewers, have an increased mortality of typhoid? In one, 'the sewage is delivered into a tank by an outfall sewer which enters some six feet below ground,' with the result that when the engine is not at work or the liquid accumulates in the well, cellars get flooded by the sewage, and sewer gases get forced up into the houses (W. H. Corfield, *The Treatment and Utilization of Sewage,* 3d ed., 1887, page 252). In another one there was no ventilation of the sewers, and sewer gas was forced back through the traps of sinks and water-closets. In another the pipe sewers are below the level of the river, so that in times of flood the sewage is backed up into the main sewer for four or five hundred yards. It is known that outbreaks of typhoid followed times of flood when the outfall sewer had been under water."

The general reduction of mortality can not be said to have extended to infants under a year to the same degree. Typhoid fever is not frequent at that early age, and when it occurs, it is mostly mild, and few deaths occur from that source.

The mortality of infants depends on different circum-

stances. Diarrhœal diseases do not appear to have been visibly benefited by improved sewerage.

Scarlatina, measles, whooping-cough, croup, and diphtheria were not rendered milder or less fatal through improved sanitation in general, and sewers in particular. On the contrary, both scarlatina and diphtheria were greatly increased; on the other hand, "cholera epidemics appear to have been practically harmless in the towns examined" (page 47). Even pulmonary phthisis exhibits a great general reduction of its death rate wherever, but only there, pipe sewerage was accompanied with measures taken for the purpose of drying the subsoil generally, such as a special system of deep rain-water culverts.

Stevenson and Murphy, page 11 of their treatise on *Hygiene and Public Health,* refer to the enteric fever in Eastney Barracks, where sewer air was forced back by the tide into the drains, which had no traps but many leaks. When traps were put in and the leaks mended, the fever subsided. Edward Seaton (*British Medical Journal,* December 23, 1893) refers to his experience with dry earth closets. When they were largely introduced after the abolition of privy vaults, the mortality from typhoid fever was greatly reduced. The English generally believe firmly in the dependency of typhoid fever on cesspool and sewer exhalation. It is true that typhoid is apt to be more frequent where there are no sewers but cesspools, but the former are but cesspools rendered entirely or mostly innocuous by their structure and isolation. If the covers were removed from the sewers they would be open conduits, in fact, cesspools, and worse than mere privies.

I believe I am correct when I say that the large majority of cases of typhoid fever we observe in New York city in September and October of every year are imported from the country. There a large concourse of people takes place, larger from year to year, in farmhouses, boarding houses, or large hotels. Many of these cases can be traced to the same place, not infrequently big hotels with a good reputation. The cases have become more numerous from year to year, and just at the time when the people thus stricken expected to be benefited by their summer outing.

Cesspool poisoning I know exists. The following case is an instance: A lady who annually took dozens of her boarding pupils to the country, hired for that purpose large farms or country places. During the whole summer not one of the children and young ladies fell sick. One day she happened to come near where workmen were emptying a large cesspool at a great distance from the dwelling and the drinking-water supply. She was exposed to the disgusting odors but a few minutes; but, not being acclimated, within ten days she came down with a very severe typhoid fever, the only case in the whole community. Typhoid fever in dwellings in which the water closets were in disorder, mainly those located in the interior of houses, I have met with in a number of instances. In the same way, and from the same cause, I have seen dysentery. In several instances I have seen tenement houses full of dysentery, where I could convince myself of the unusual filthiness and offensiveness of the common privy in the rear of the place. In ill-kept sick-rooms or hospital wards, where dysenteric stools are not disinfected and removed, dysentery will spread.

There are many authors who go far beyond this. Dr. George Cordwent (*British Medical Journal*, November 25, 1893), is more positive than most of those who, like him, believe in the direct production of infectious and contagious diseases by defective drainage. He is even anxious to substitute "privy odors" for sewer air, and takes it for granted that bad drainage "frequently evolves gases producing typhus, diarrhœa, etc., often *without* diphtheria; but of forty-three cases of diphtheria—all rural—all occurred in houses pervaded by a strong privy odor. He adds that this is a condition then quite usual in the laborer's cottage, but does not say why there were, in the course of three years, 1858-'60, not more than these forty-three cases, nor why there were none of them before those years. The real explanation of it all is that there *were* cases of diphtheria when the mucous membrane, affected by the influence of gases, was invaded by diphtheria germs, and there were none, in the same prevailing conditions, when there was no diphtheria about. At all events, however, it is a

grave mistake to consider "privy odors" and a specifically infected atmosphere identical. They are far from so being. No specific germ has an odor.

R. W. Parker commits himself unmistakably in favor of sewer-air borne diphtheria. His reasoning is simple. For fifteen years he met with cases in which the infection appeared to come from drains. The special infective material has got into the drainage system. There will be more and more diphtheria, since the main drainage system is now largely ventilated directly into the open streets. The ventilators, while they protect the individual houses, poison the whole atmosphere and spread the disease broadcast. It is this cause to which the increase of diphtheria in London is said to be largely due. So in his opinion the ventilation of the sewers is a great danger. It would be so if the ventilation of a sewer be defective; if, for instance, there were but a single outlet to the subterraneous cesspool, the odors and exhalations would be disagreeable, and possibly harmful. Diarrhœa, nausea, vomiting might be and are produced in those exposed to the odors—children with vulnerable mucous membranes and respiratory organs only two feet above ground would be principally endangered—but unless there were a specific germ, or rather a number of germs, in the exhaled air there would be no specific disease. If there were any admixture of specific germs, they would be, the worse the odors of putrefaction, the sooner destroyed and rendered innocuous.

In the *Lancet* of January 13, 1894, H. Grant Sutton, M. D., relates the following incident: On March 25, 1892, diphtheria broke out, and afterward spread, one hundred and fifty yards from a quay on which immense masses of decomposing animal and vegetable matter, rags, woolen materials, old chair seats, feather beds, and all kinds of rubbish and filth were burned and lay smoldering for weeks. "Though the gases are volatilized their poisonous properties are not destroyed, and so these noxious fumes are carried in the direction favored by the wind, one of which would probably be over the village where diphtheria did actually occur." Now, the report is not positively clear as to whether the refuse of the city is actually and com-

pletely destroyed by burning or not. Even if it be so, depositing and the burning are not simultaneous, and it appears very much more probable that the wind carried diphtheria germs directly from the huge masses piled up. Is that possible or probable? I believe it is. In spite of the great diffusibility of gases, they are liable to remain in a solid mass. Our tornado experience proves that moved air passes through many miles with sharply defined boundaries; and standing on board a steamer we see the masses of smoke and steam cling together, even for miles, in an unbroken column. So it is quite possible for the wind, if it be strong enough, to carry disease germs to a distance. But the co-operating requirements of such a result must be the ample presence of pathogenic germs, the absence of disinfectant sunshine, and wind blowing sufficiently strong in one direction.

Begging the question and absence of logic are great aids in making mistakes and perpetuating popular prejudices. In the coolest manner possible Nicolaus Gerzetic (*On Parasitism and Disease Producers,* 1893, p. 96) delivers himself as follows: "It is well known that sewer air carries pathogenic germs, like those of diphtheria and gastro-enteritis, even typhus, according to Buchanan and others."

George Carpenter, M. D., of London (*Arch. of Pæd.,* May, 1894), goes further than his predecessors. He attributes a case of diphtheria occurring in an airy house located in a healthy district to the inhalation of the foul air emanating from a putrescent placenta which had been left in a night commode at the head of the bed. He means to prove that decomposing animal and vegetable matter can be readily and very reasonably accused of inducing the disease, and besides declares it probable that the diphtheritic virus has found a suitable nidus in these decomposing materials for its growth and propagation, and the engrafted virus is the real cause, though not the apparent one. "In the same way sewer air acts as the vehicle and not the cause." "By a rational process of thought we feel that this must be so, but sometimes a case crops up to which our reasoning does not apply, and we are left

wondering as to how a decomposing mass of matter could become infected."

I should say it could not; for if there is a power that destroys pathogenous germs it is putrefaction.

In many instances the reasoning in this matter is simply emotional. Thus, according to the *Massachusetts Association of Boards of Health, Official Journal,* September, 1893, page 23, mention is made in the discussion on a recent law passed by the State Legislature of Massachusetts on the licensing of plumbers of Mr. Roe, of Worcester, who introduced the bill and worked for it. He is mentioned as " a man who had difficulties to encounter in his own house regarding unsanitary conditions. His child died of diphtheria, and the house was examined by an inspector of our board and found to be in an unsanitary condition. At the time he was loath to accept it as the cause of the death of his child, but eventually he felt convinced. He is an ex-principal of our high school here and a broad-minded man, and is thoroughly convinced of the fact that the child must have died from the effects of the unsanitary conditions." This is the kind of report that will influence public opinion. Emotional reasons in place of scientific reasoning will always carry the day. *Credo quia absurdum est.*

Some of the medical reasoning is not much better. For instance, Barnes (*Brit. Med. Jour.,* July 28, 1888), studied fifty separate outbreaks of diphtheria for the purpose of discovering if diphtheria may not arise from certain combinations of filth and unsanitary conditions independently of a pre-existing case of the disease. According to him the prevalence of diphtheria in rural districts is explained by the want of suitable systems of drainage, combined with filth in the form of decomposing animal matter. In the majority of instances he found no previous case as the starting point of each outbreak. Besides, the author claims that the winter months, when most diphtheria is met with, are unfavorable to the development of low forms of animal or vegetable life—he forgets that the throats and the houses are warm—and believes that because sore throats existed previous to and simultaneously with the outbreaks of diphtheria, it follows that we have

to deal not with a specific germ but with a poison gradually developed.

In the *Medical Record* of January 28, 1893, Dr. Louis Fischer approached the subject a little more seriously. He published a very interesting article on "The Result of Examinations of Sewer Gas which Escaped in Tenement and Private Houses wherein Cases of Diphtheria Occurred." It is to prove that escaped sewer gas will easily enter houses and poison their inmates. As a single positive proof would prove more than a thousand negative observations would disprove, I have carefully read and reread the paper. I can not learn, however, that his conclusions are unimpeachable. A child had diphtheria; the house was a tenement, four families on a floor; in the previous winter there had been diphtheria on the floor above and the floor below on the same side of the house. The doctor says "the disease broke out successively on different floors and was seemingly spread by way of the sewer pipe leading up through the house. On the other side of the hall diphtheria did not break out."

He then describes the deterioration of the air in the room, due to the closing of windows in the narrow quarters and to the proximity of the sink into which sewage and refuse was emptied, and adds that underneath this sink there was a trap which served as a reservoir and to exclude noxious gas coming from the sewer.

He does not say that the trap was defective, nor that there was any reason why the disconnection of room and main sewer should have ceased. He simply assumes that because there was diphtheria above and below in the previous winter, there must be a communication of the germs through the pipes into the intermediate floor, which, however, was protected by a trap a year afterward.

Moreover, he alludes, himself, to the fact that what is thrown down into the sink and the reservoir underneath may be deposited there and, under favorable circumstances, may there find a convenient culture medium. Still more, he reports that he found bacilli in the air of a room where diphtheria existed, and in an adjoining room (not con-

nected by a waste pipe at all); also that he made a series of examinations of air in a number of other houses with the following results: Of eighty-five experiments performed, forty-five must be excluded owing to carelessness and breakage of plates. Of the remaining forty, twelve yielded pathogenic bacteria; eight, different micro organisms (non-pathogenic); and twenty were negative. Thus, in thirty per cent. pathogenic bacteria were found in miscellaneous houses, which merely proves that pathogenic germs are ubiquitous and waiting for chances. These chances are *reduced general health, diminished power of cell resistance, and denuded surfaces.*

After Dr. Louis Fischer had looked for dangers "in the gases arising from sinks," and emphasized that "sewer traps themselves may become, if not properly flushed, breeding grounds for bacteria," Dr. F. W. Koehler claimed at once that "defective sewer pipes, dampness, and lack of cleanliness account for most cases of diphtheria occurring in private practice" (The Prevention of True and False Diphtheria, *Medical Record,* September 30, 1893). The better part of his paper may be repeated here, not because it is new, but because it is true: "The waste pipe of a washstand or sink may be a source of infection. I refer to that part of the pipe between the external part of the external opening and the nearest trap. This section of the sewerage gets the warmth of the house, has quantities of organic matter poured into it, has water more or less constantly running through it, always contains air, and is consequently a most perfect culture ground for many kinds of bacteria. The traps may therefore be in perfect order, and yet we may not be safe. Some device to shut off also this part of the sewerage system from all communication with the atmosphere of the house seems to me badly needed." In reply, I should say disinfect sink and trap once a day.

In all this question of cesspool and privy exhalation, what we know tolerably well is this, that it may result, as it frequently does, in a pharyngitis—the pharyngeal and naso-pharyngeal mucous membrane being exceedingly irritable—and that bacilli, being ubiquitous during the reign

of an epidemic, may find a nest in the sore surface.[4] The *Bacillus diphtheriæ,* in particular, is not in the cesspit and has not been found there, for putrefaction deals as inclemently with bacilli as with other organic matter.

There is, however, no doubt as to the difficulty encountered when the origin of an individual case of diphtheria is to be explained. The following case will give an instance of the various ways in which diphtheria may arise without sewer gas or spontaneous generation.

Dr. W. W. Ralston, of Horton, Kan., communicated to me the case of a boy who died in a neighborhood where no case of diphtheria had ever been known to exist, who lived under the best possible circumstances—good drainage, good air, no contagion, good health. Two years previously a child died of diphtheria in Chicago, where the family then lived. Afterward they lived in Detroit, later they moved to Kansas, and with them traveled a swab which had been used on the diphtheritic child in Chicago. When the little boy was (in Kansas) taken with a suppurating amygdalitis, the mother bethought herself of her swab, and used it to apply an alum solution. Thus it was that her boy died (*Arch. Ped.,* 1889, p. 131).

In the face of such a fact the weight of such cases as will now be quoted is of not much account.

Dr. Philip Francis Harvey (Fort Keogh, Montana) publishes two cases of diphtheria from "faulty drainage" (*Lancet,* 1892, i, p. 1184).

The first case was that of an officer of the United States army who had not been exposed to any known source of contagion. The case proved to be very malignant, and terminated fatally by heart paralysis after about eight days' progress. One week later the patient's wife developed a fatal attack. The disease originated *de novo* at an isolated military post in a new brick building. The location of the post was high and dry on a plateau between the confluence of the Mississippi and Minnesota Rivers.

[4] It is a common experience that in a family of children such as are suffering from a catarrh will be taken with diphtheria if any of them are.

A thorough sanitary inspection of the house was made, and a faulty drain was found in the basement with some leakage of sewage into the earth at that point. Here, then, was the explanation of the origin of the disease, and a demonstration of how rapidly the diphtheritic poison may *be formed* under circumstances *favoring its evolution,* as the cases occurred in January, and the premises were first occupied the preceding November.

Another case was reported, under the same heading, by Dr. N. Mallins (*Lancet,* 1892, i, 579). It was that of a boy ten years of age, who was attacked with membranous sore throat, followed in a few weeks by almost universal paralysis, a circumstance that proved its true diphtheritic nature. The boy slept in a small room directly over the scullery, and for weeks past a most unpleasant smell had pervaded this room. The scullery sink was found to communicate by an untrapped—in places broken—pipe with a cesspit situated about twenty-five yards from the house. There was, therefore, every opportunity for the foul air from the cesspit to be siphoned into the house. The patient was carefully isolated, and, though he was one of a very large family of children, no one else caught the infection. As there was not a single case of the disease in the neighborhood, as the boy did not mix with any children except his own brothers and sisters, and lastly, as he was the only one in the family sleeping in the line of escape of foul air, the conclusion seems irresistible that in this case, at all events, the diphtheritic poison was conveyed in the emanations from a foul drain, such emanations polluting the air that was nightly breathed. How the specific bacillus got into the cesspit is, of course, a very difficult matter to explain.

The possible causes of an invasion of diphtheria are so many that a resort to an autochthonous origin ought to appear superfluous. Perhaps, however, it is the very multiplicity of possibilities which acts confusing and bewildering: the vulnerability of the young mucous membrane, the frequency of nasal and pharyngeal catarrh, the narrowness of the nose, the large size and the softness of the tonsils, the frequent fermentation of food in the mouth, the

sucking of the soiled little fingers, together with the influence of family disposition, which is more powerful in the young. Their constant intercourse with each other in large families and in densely populated houses and districts, in schools and on playgrounds, the possibly long period of incubation during which the disease is contagious though giving rise to no symptoms, act as just so many predisposing causes of contagion; and the large number and size of the lymphatics renders every attack so much the more dangerous.

The very fact that diphtheria need not always be of the same type; that many cases of lacunar or follicular amygdalitis ("tonsilitis") are diphtheritic—a fact proclaimed by me dozens of years ago, which I have the satisfaction of seeing more and more, though with great hesitation at first, established even by bacteriologists—that there are as many cases out of bed and out of doors as in bed and indoors; that, particularly in adults, diphtheria may last long and give rise to but few embarrassing symptoms, and that a mild case of diphtheria may produce very serious ones by contagion, renders contagion by nursery maids and other domestics—by teachers, seamstresses, sick-nurses, workmen, factory girls, shopkeepers, barbers, and all other persons mingling with the many extremely easy. The persistent vitality of the diphtheria germs, as is well known, may extend over years. They cling to solid and semi-solid bodies, are imported in milk, cling to walls and floors, to toys, to curtains, towels, clothing, and bedding which is so often kindly donated to the poor by the benevolent well-to-do when they wish to get rid of their dangers. They stick to omnibus and carriage cushions, to rail-car seats, to the either ready- or custom-made coat on your shoulders near which your baby will nestle—the very coat that is sold in Broadway palaces after it has been made in the pest-stricken tenement sweating shop. The very restlessness of our people, the frequency of moving, is another cause of doubling the number of cases. There can be no doubt besides that many animals—horses, chickens, cows—have and spread diphtheria. Thus it appears that we ought to think twice, and indeed many times, before admitting

among the causes of diphtheria new factors which can not be proved.

"No contagion could be traced." That is the introduction to every wild and uproved theory of indigenous spontaneous generation. When a case of cholera breaks out in a village a thousand miles away from the coast, is there anybody in our time who looks after chemical poison in a well or for filth on the roofs? You look for direct or indirect contagion from a tangible source. Why not so in diphtheria? In the *New York Medical Journal* of September 27, 1886, I have quoted from Isambert the case of a medical assistant who had nasal diphtheria many months, and then traveled half a year to get rid of the last remnants. He fully recovered; but how many deaths did he spread—from railroad car to railroad car, from stagecoach to stagecoach, from hotel to hotel? How many may have been the physicians who searched in vain for the causes of the sporadic cases suddenly springing up in their places, and the epidemics generated by them along the roads on which the luckless French wanderer after his own health strew out his curses? Nobody suspected the traveler who left days ago, just as nobody may be able to trace every outbreak of cholera to the unknown person who carried it upon his person or in his bowels. Nor is this an isolated case of a long duration of diphtheria. Cadet de Gassicourt operated for laryngeal diphtheria after eighteen, twenty-three, and forty-three days. Sanné had croup patients who recovered after twenty-seven, thirty-two, and sixty days. I know of many cases of diphtheria protracted into the second or even the third month.

Such facts, pointing as they do to the ready communicability of diphtheria, have influenced my opinion from early times. I can not see anything miraculous in the sudden appearance of a *Bacillus* or a *Streptococcus diphtheria* in a person *apparently* not exposed to it. During an epidemic there is *nobody not exposed* to it, and everybody is subject to it under favorable circumstances. The latter mean a fit condition of the human integument, either cutis or mucous membrane, which makes them liable to become a resting place for the germ. That fit condition is

a slight or severe wound, abrasion, denudation of the surface. As no healthy surface becomes erysipelatous in spite of erysipelas being epidemic, as Fehleisen's bacillus requires a sore, so diphtheria, being ubiquitous and waiting for a chance, will stick to a cutaneous wound, a stomatitis, a pharyngeal or nasal catarrh, and will rapidly multiply. A resected tonsil will thus be covered with a pseudo-membrane within a day. Only yesterday Dr. Caillé reported in the meeting of the American Pædiatric Society such a case. It terminated in generalized (including laryngeal) diphtheria. Without the operation, that tonsil might not have been affected at all.

In my paper on diphtheria and diphtheritic affections (*Am. Med. Times,* August 11-18, 1860) I acknowledged contagion only as the cause of the origin of an individual case. In 1861 [5] Jenner, after an experience of five years among the poor and the rich, maintained the independence of diphtheria from bad hygienic conditions, and stated even a larger mortality among the rich. In a lecture published in *Guy's Hospital Gazette,* 1873, Samuel Wilks reports that it spread from the focus in Folkestone along the eastern counties of England, apparently quite irrespective of soil, impure atmosphere, or drainage. As regards London, it was more frequently met with in the better class of houses in the suburbs among the lower and dirtier habitations of the poor. These views were not exactly refuted by good observations, but did not strike the fancy of the medical public. Jenner's view was strongly condemned in an otherwise favorable review contained in the *Dublin Quarterly Review,* August, 1861; nor was the conviction of the profession in this respect much changed before the appearance last year of Thorne Thorne's book, which again proves, as I tried to do thirty years previously, contagion as the ætiological influence, without relation to bad sanitary conditions as regards water supply, sewerage, and drainage.

In the discussion on the same question contained in the *British Medical Journal* of the two last months of 1893 and the beginning of 1894, Dr. Wilks again takes a lead-

[5] "Diphtheria; its Symptoms and Treatment."

ing part. His opinions on the same question have not changed. Davis, Priestley, C. M. Jessop, J. Bunting express themselves in the same way. George Johnson, Parker, C. N. Allfrey, H. G. Warrey (who assumes that every "membrane in sore throat is always diphtheritic"), and P. G. Marriott favor the sewer-borne origin of the disease; and George Johnson associates with diphtheria, in this respect, typhoid fever, pneumonia, puerperal fever, and albuminuria, which "may have such an origin," and charges that "those who believe in contagiousness only will not look for bad drainage." A few of his cases, which are to prove his point of view to be correct, are the following: In a wealthy house an infant was circumcised for phimosis; the wound became diphtheritic, and did not heal until the patient was removed to another house. Two servants were also affected with diphtheria; after defects in the sewer pipes were found and corrected no other case occurred. Another case is that of a butler in a wealthy and healthy house who contracted diphtheria. An untrapped sink pipe was discovered near his sleeping room. He recovered, and there was no other case after the defect was mended. More, however, we do not learn, particularly nothing to exclude the hundred possibilities of contracting the disease.

If you will permit a personal remark I should here say that in spite of my positive statements, repeated a dozen of times in writing,[6] and a hundred times in lectures and discussions, I have personally been claimed as favoring, in the case of diphtheria, the sewer-air theory. As late as this year, Emil Feer (*Aetiologische und klinische Beiträge der Diphtherie,* 1894) says (page 67) that "both in England and America there is a prevailing opinion, both among the medical men and the public, that uncleanliness of dwelling and people is a main cause of disease; in these countries diphtheria is often called a filth disease. According to Jacobi the connection between diphtheria and filth has, it is true, not been proved, but the author states

[6] With the exception of a careless expression on page 50 of my *Treatise on Diphtheria,* which is quite in contrast to my previous statements in the same chapter.

as the result of his conclusions that it exists; for there are many reports which exhibit the co-existence of diphtheria and filth." A few moments later he gives me credit for a teaching which is also opposed to life-long convictions, for he adds: "The injurious influence of sewer gas and cesspools is emphasized by Baginsky, Monti, and English and American authors (Jacobi)." Of my writings, he quotes only my article on Diphtheria in Gerhardt's manual, 2d volume, of 1877. The only allusion to sewer gas contained therein is found on page 703, where I say that the influence of the seasons on the origin and the course of diphtheria is but conditional and indirect, in a similar way as that of "filth," or sewer exhaustion.

In the November number, 1888, of the *Archives of Pædiatrics* the late Dr. Charles Warrington Earle published a brief article on "the influence of sewerage and water pollution on the prevalence and severity of diphtheria." He begins by saying that "it has been claimed by many that imperfect sewerage has been the cause of diphtheria, and the people, urged on by the opinion of the doctors, frequently blame a sewer for poisoning a family and producing diphtheria, when the cause should be placed elsewhere. It is much better for us to recognize the true cause, if it is possible to find it, rather than to attack an imaginary one, for it is possible that while we are fighting the supposed gas as the cause, we are losing sight of the real enemy which should engage our attention."

"Jacobi says that cases of diphtheria which are traced to exhalations from sewers, or even to filthy habits of life, are very frequent. This opinion, especially in regard to sewerage, has been reiterated by scores and hundreds of physicians. It represents the prevailing idea of American physicians." Then Dr. Earle prints the opinions of a number of correspondents who deny the origin of diphtheria from sewerage, and shows me the errors of what he believes to be my ways.

Now, as it is both unhistorical and unpleasant to be charged, after a life in part spent on the study of diphtheria, with the very erroneous views always combated by me, I tried to refute Dr. Earle's allegations in the Novem-

ber number, 1888, of the *Archives of Pædiatrics* (page 744). As my letter to the editor contains in the briefest possible way a statement of what I believe to be the facts, I beg to here repeat them.

"In my very first paper published on the subject (Diphtheria and Diphtheritic Affections, *Amer. Med. Times,* August 11, 1860, p. 96), I looked for the source and epidemic occurrence of diphtheria in contagion to the exclusion of any and all other alleged causes.

"On page 34 *et seq.* of my *Treatise on Diphtheria* (1880) you may read these remarks: 'Cases of diphtheria which are traced' (I might have said attributed) 'to exhalations from sewers (or even to filthy habits of life) are very frequent. Yet typhoid is attributed to the same causes. So is dysentery. Can these foul exhalations produce alike diphtheria, typhoid, and dysentery? Do these diseases arise from a common poison? Or is the poison of a treble character, so that a part may give origin to diphtheria, the other part to typhoid, the third to dysentery? In a house in West Twenty-second Street, between Eighth and Ninth Avenues, in New York, three children and a female help were taken sick, two with dysentery and two with typhoid, in the course of a month. In the same house, in two of the children diphtheritic sore throats were of frequent occurrence.

"'Have we to deal in such occurrences with special influences, or only with a lowering of the standard of health, thereby affording other morbid influences an opportunity to exercise their power?'

"I then quote (page 35) the results of the researches of the Board of Health of the State of Massachusetts, the third of which reads as follows: 'A positive connection between diphtheria and filth can not be verified, although the latter adds to the evil influence of moisture.' This statement I call (page 36) 'modest and sensible,' and one 'for which we have to be thankful.'

"In Diphtheria Spread by Adults (*New York Medical Journal,* September 24, 1884) I say: 'No permanent spontaneous generation is claimed or has been proved for cholera, scarlatina, or variola. Nobody looks for their

primary cause in moist walls of houses, dry dust of streets, in the prevalence of previous house endemics of typhoid fever, measles, or other eruptive diseases, in bad ventilation, in the odors of hospital wards, in putrefying kitchen refuse, or in the exhalation of sewers. But both medical men and laymen are found to be inexhaustible in accusing and condemning all those detrimental influences, not as being predisposing elements, not because of their injurious influence on health in general and on the condition of the mucous membranes in particular, but as the main and frequently sole causes of diphtheria. In the minds of many physicians, diphtheria is intimately linked with sewage; with them the trap of the water-closet and the plumbing of the cellar are the first objects of attention, the patients and their families, fauces and nares coming in for a relatively smaller part of their care. If they would pay more attention to the direct sources of contagion, which is something understood and definite, than to the indefinite and unproved presumption of specific poisons in the outlets of the house or the inlets from the sewers, their ætiology would be something more positive in a great many cases.

"'I do not mean to say that the house hygiene ought not to be looked after by the physician in every case of sickness, but the more I have seen the more it has occurred to me that we may live to reach the conviction that there is but one predisposing element, viz., a sore mucous membrane, and but one cause of an individual attack of diphtheria, viz., direct contagion.'

"In a paper on 'The Therapeutics of Diphtheria,' read before the Medical Society of Philadelphia, May 23, 1888, which has been copied by half a dozen medical journals, I made the following remark (reprint, page 1): 'Diphtheria is a contagious disease. There is probably no spontaneous origin of diphtheria, any more than there is a spontaneous origin of cholera or scarlatina.' And again (page 3): 'When an attack of diphtheria has made its appearance, it is well enough to examine the hygienic condition of the house, with its deteriorating influences on the general health of the inmates, but look after the source

of the case in the persons of friends, attendants, and help.'

" In my remarks on the 'Nature and Treatment of Diphtheria,' made by invitation before the Section of Diseases of Children of the British Medical Association, August, 1888 (*British Medical Journal,* September 22, 1888), there are found the following sentences: 'Foul air and sewer gas do not create diphtheria; they do create dysentery and typhoid, or such a condition of general ill health and malaise as to afford the diphtheritic virus a ready resting place. There were plenty of malodorous privies and foul smells fifty years ago, but no epidemic of diphtheria. Besides, and mainly through the careful observations of English physicians, such as are contained in Dr. George Turner's report on diphtheria in the lower animals and many others, the sources from which diphtheria may come are very many. Pigeons, fowls, turkeys, chickens, pheasants, cats, horses, sheep, cows are just as many sources of diphtheria for man. Foods of all kinds, vegetables and milk, will transmit it. It sticks to furniture, floors, and wall paper, railroad cushions and school desks. No spontaneous generation is required to explain its ravages.'

" These extracts, Mr. Editor, ought to prove that Dr. Earle does not stand alone with his views so ably discussed in your journal. Like him, I have always lamented the disposition of so many of us to look for the cause of an individual case of diphtheria in the wrong quarter. Like him, I have often found a professional brother inspecting traps and cellar floors, while the rest of the children of the family were permitted to play in the rooms and about the beds of these affected with the malady.

" I have never believed, nor do I believe now, that sewer gas *per se* is a cause or the cause of diphtheria. A sewer or a trap can convey diphtheria only when that particular sewer or trap has been infected with diphtheritic poison."

After these quotations and to-day's remarks, I hope I shall be counted among those who will rather look for the cause of diphtheria in a germ communicated, directly

or indirectly, from a patient or his belongings than from sewer air. The latter can not be made responsible enough in an occasional case where the introduction of germs into the sewer or into the sewer air, and their presence in the pipes, and their introduction into a house and their presence there are proved facts. My convictions tally with the experience of those who have seen much.

In a conversation with Dr. J. D. Bryant, for many years health commissioner of the city of New York, I learned a number of interesting facts. Since 1873 there has been an incessant war against defective plumbing; traps were enforced, and since 1878 roof waste pipes. When Dr. Bryant entered upon his office the earthen or brick connections of house drains with the street sewers were replaced by iron. In reference to every case of infectious or contagious disease a strict inquiry was required, on the part of the medical inspectors, concerning ventilation and sewers, even of the adjoining premises. Many inspectors who did not find or report actual defects were discharged. The general result of the investigation concerning the coexistence of an infectious disease and defective sewer was, however, negative; the number of cases where defects in joints and waste pipes were met with in such cases was limited. The large majority of diphtheria cases were found in tenement houses. Still, sewer and drain defects were more frequent in private houses containing two or three families than in tenement houses. No special class of people were mainly affected. Diphtheria was alarming in the city of New York before and after the Health Department was established. In answer to my direct question I was told that both diphtheria and typhoid occurred where plumbing was perfect, and were often not found where it was defective. Many typhoid cases were imported from the country in September and October. Dr. Doty related the case, and referred to many similar ones, of a baker who lived in Tenth Avenue with his family over an open earthen and brick sewer into which a privy found its outlet. There was no case of sickness. Physicians always looked for and searched for sewer gas or sewer infection; but the comparative statements of a number of

inspectors were negative. Nor could it be said that there were more cases of diphtheria or other infectious fevers near the outlets of sewers or in the immediate proximity of stables.

Dr. William H. Park sends me the following abstract of a paper of his recently read:

"From the reports from a large number of cases of diphtheria it has been shown that bad drainage and bad plumbing have but little noticeable effect upon the spread of diphtheria in New York City. Though we may readily believe that the escape of sewer gas into a room might easily predispose to sore throats, and thus perhaps render persons more susceptible to diphtheria, the Health Department inspectors have not been able to find any cases where the infection with diphtheria came through bad sewer connections.

"The maps which we have in our possession show well how all the tenement districts of New York are infected, and not certain ones over old sewers or streams; also diphtheria is found about as frequently in the garret as in the basement."

Mr. Archibald Montgomery, a very intelligent master plumber of more than twenty years' experience, gives the following as the result of his observation:[7]

"Plumbers do not lose more time from work on account of sickness than do mechanics in general.

"Emanations from decomposing night soil, etc., may cause vomiting, but not diarrhœa. The effect is only transient.

"Typhoid or other fevers are not more common among plumbers than among other workmen.

"The accidents arising from entering sewers are the result of the presence of either illuminating gas which has leaked into the sewer from the gas mains, or of carbon dioxide formed from the decomposition of sewage.

"In places where the level of the sewer is below the general line, carbon dioxide is liable to form in large quantity.

[7] Communicated to me by Dr. A. H. Smith, the president of the Climatological Society.

"The inoculation of an abraded surface with sewage often leads to great local swelling, with implication of *lymphatic* glands and general symptoms of 'blood poisoning.'

"There is no discrimination against plumbers by life insurance companies."

I may be finally permitted to add the oral testimony of more than a dozen European medical men, and dozens of Americans. Every one was asked by me: What do you know of the production of a specific germ disease out of, or through, sewer air? The uniform answer was: There is a general vague impression among the public, but I never saw a case, or could prove one.

Some of the conclusions to be drawn from this paper would be as follows:

The atmosphere contains some specific disease germs, both living and dead.

They are frequently found in places which were infected with specific disease.

In sewer air fewer such germs have been found than in the air of houses and schoolrooms.

Moist surfaces—that is, the contents of cesspools and sewers and the walls of sewers—while emitting odors do not give off specific germs, even in a moderate current of wind.

Splashing of the sewer contents may separate some germs and then the air of the sewer may become temporarily infected, but the germ will sink to the ground again.

Choking of the sewer, introduction of hot factory refuse, leaky house drains and absence of traps may be the causes of sewer air ascending or forced back into the houses. But the occurrence of this complication of circumstances is certain to be rare.

Whatever rises from the sewer under these circumstances is offensive and irritating. A number of ailments, inclusive, perhaps, of sore throats, may originate from these causes. But no specific diseases will be generated by them except in the rarest of conditions. For specific germs are destroyed by the process of putrefaction in the

sewers, and the worse the odor the less is the danger, particularly from diphtheria.

The causes of the latter disease are very numerous, and the search for the origin of an individual case is often unsuccessful.

Irritation of the throat and naso-pharynx is a frequent source of local catarrh; this creates a resting place for diphtheria germs, which are ubiquitous during an epidemic, and thus an opportunity for diphtheria is furnished.

Of the specific germs, those of typhoid and dysentery appear to be the least subject to destruction by cesspools and sewers. These diseases appear to be sometimes referable to direct exhalation from privies and cesspools. Very few cases, if any, are attributable to sewer air.

A single outlet from a sewer would be dangerous to general health because of the density of odors (not germs) arising therefrom. Therefore, a very thorough and multiple ventilation is required.[8]

The impossibility or great improbability of specific diseases rising from sewers into our houses, protected as they are, or ought to be, by good drains and efficient traps, must, however, not lull our citizens and authorities into indolence and carelessness. For the general health is suffering from chemical exhalations, and the vitality of cell life and the power of resistance are undermined by them.

[8] The sidewalk ventilators in New York city are almost always obstructed.

SMOKE IN RELATION TO HEALTH

Up to the year 1000 the German home had its fireplace in the center. The smoke escaped through a big hole above, which was covered by a second roof that kept the rain out. Light got in as best it could. The Westphalian home in which I was born was still of that kind, like a hundred thousand other North German peasant dwellings. In the oldest times a few holes were also cut into the sides of the house. My people, however, had small glass windows, but then I was born in 1830—after Christ, you know. Wood and peat were exclusively used until the end of the twelfth century; coal is mentioned. The first information comes from Lüttich (Liège). In the fourteenth century coal was used in Aix-la-Chapelle; in 1429, about the river Saar. Since that time, but never like the present, was the air filled with carbon dioxid, sulphurous acid, sulphuric acid, hydrochloric acid, and sulphid of hydrogen. An equal annoyance, if not danger, is caused by the unconsumed soot.[1]

Dr. Charles A. L. Reed, chairman of the Committee on Medical Legislation of the American Medical Asso-

[1] While this paper was awaiting publication, Dr. Theodore W. Schaefer had an elaborate essay full of quotations and suggestions in the *Boston Medical and Surgical Journal*, July 25, 1907, on "The Contamination of Air with Sulphur-Dioxid." London, according to his statements, burns 30,000 tons of coal daily, which gives rise to 300 tons of soot and large quantities of carbon dioxid and sulphur dioxid. This last named gas is converted into sulphuric acid, twenty tons of which are annually brought down in the rain falling in the cities of Glasgow or in Manchester. It owes its origin to the iron pyrites which form 3 per cent. of the coal. When 40 parts of the acid are contained in one million parts of air the vegetation suffers intensely, and the lungs of men—?

ciation, delivered an address [2] on the subject of smoke before the Woman's Club of Cincinnati. On that occasion the medical aspect of the question was not emphasized. But smoke-filled air imposes extra and unnecessary drudgery on the housekeeper. Woman's privilege to wear clean clothing is ruthlessly disregarded by the makers of smoke and the permitting municipalities. Women should, therefore, individually and through their organizations, protest vigorously against the present conditions. Moral dirt also is closely united to physical dirt, and a clean community has the better chance to avoid degeneracy.

The ill conditions are national and not local, so that something more than local effort is needed to combat them. Therefore, he proposes co-operation, national in extent, to create public sentiment, to determine the facts and adjust conflicting interests, to demonstrate plans and appliances for smoke prevention, and to formulate a standard law to secure uniform regulation of the evil all over the country. He suggested a national "anti-smoke convention" to execute these plans, this convention to be really representative of all concerned interests, and to be instructed by competent specialists, engineers, physicians, sanitarians, manufacturers, attorneys and others. The assistance of the press must be secured.

Such is also the opinion expressed in an editorial of *The Journal* of the American Medical Association, May 20, 1905, which, moreover, expresses its categoric opinion that "the crusade against unnecessary city smoke is more social than medical, and yet has a real interest for physicians. The direct harmfulness of smoke to the human organism is not wholly clear." Thus *The Journal* claims or admits that smoke and other products of soft coal semi-combustion vitiate the atmosphere, depress the organism, injure the integuments, cause deficient oxygenization and edemia, mainly among children, and oblige people to seek the country.

It is time we should drop the idea that the smoke question is only social and not medical. If that were so the

[2] Amer. Med., April 29, 1905.

natural sciences would have little to do with it, and not even the law of the land or of esthetics could ever reach it.

I have availed myself of some opportunities to inquire from medical friends in Pittsburg, Cincinnati and Chicago whether in their knowledge clinical statistics, autopsies or other experience have been gathered with a view of enlightening the medical profession on the smoke nuisance in its sanitary aspects. Only from that point of view can we hope to aid in ridding the community of an anomaly created by the recklessness of modern industry, which is always willing to coin gold out of human corpses of its own making.

Now it happens that *The Journal* of the American Medical Association, July 7, 1906, arrives at the conclusion, based in part an Ascher's statistics and experiments, that the fighting of the smoke nuisance "should be made part of the general plan of the campaign now in progress against tuberculosis and pneumonia." Since that time the Philadelphia County Medical Society has discussed the problem in its meeting of June 27, 1906, in which Drs. J. Madison Taylor, W. M. L. Coplin, C. G. Grayson, L. Webster Fox and Henry Leffmann took part. That the nose, throat and eyes are directly injured by smoke was admitted beyond doubt, but whether the presence of soot in human lungs is an indifferent matter or an injury was left undecided. It must have pleased the sinning part of the industrial world to hear from a participant in an unprepared and unguaranteed professional, if not medical, discussion the statement that there is little evidence to show that "the presence of smoke in the air increases especially"—what, if you please, is especially? —"the morbidity or mortality of a community."[3] Dr. Henry Leffmann also spoke of the practicability of preventing the smoke nuisance.

The sixty-sixth annual report of the registrar general of England demonstrates an increase of the mortality depending on bronchitis and pneumonia in England until

[3] *The Jour. A. M. A.*, Aug. 4, 1906.

the quinquennium of 1891-1895, and a considerable decrease since. In connection with the latter fact L. W. Chubb[4] observes that eighty cities—London, Liverpool, Manchester, Sheffield, etc.—report a decrease of smoke since that time. Brodie, the meteorologist, points to the diminution of London fog which is occasioned by the absorption of atmospheric water by sulphur dioxid with its specific gravity of 2.25. His colleague, Rollo Russel, reports a marked effect of the compulsory prohibition by law of smoke.

According to Mr. James River, the medical officer of Manchester, the fog days and the mortality from acute pulmonary diseases have become less. There were in Manchester during each of the five years from 1896 to 1900, inclusive, 36.8 fog days; in the five years from 1901 to 1905, inclusive, 23.4; and of 1,000 deaths there were in the former quinquennium, among all ages, 5.04 per cent., in the second 4.28 per cent.; among infants under 1 year 33.53 and 31.10 deaths, respectively. In the same report Primrose[5] publishes the results of investigations made in Glasgow on rain, which prove the decrease both of acids and of soot.[6]

His method of a chemical examination of the atmosphere resembles that which W. L. Russell followed in London and Angus Smith before him.[7] After them J. B. Cohen, the professor of organic chemistry in Leeds, suggested an efficient, mostly new, examination both of the rain and the air, in a book of his own: The Air of Towns, reprinted from the Smithsonian Reports of 1895, Washington.

The experience gathered in England has suggested a number of rules which are vigorously enforced in a number

[4] Report on returns by local authorities with regard to the carrying out of their powers and duties in the matter of smoke abatement. London, 1905, Conference on Smoke Abatement.

[5] A plea for a systematic comparative analysis of the air in towns.

[6] Ascher (L.): The Fight Against Smoke in England and Germany, D. Viertelj. f. öff. Ges., xxxix. 2, 1907.

[7] Monthly weather report for April, 1884, London, 1884.

of towns. In London and Manchester no factory chimney may expel a black smoke for more than a minute every hour. In Professor Harvey Littlejohn's report on the causes and prevention of smoke from manufacturing chimneys (city of Sheffield, 1897) are enumerated twenty-two cities which enforce a duration of not more than from one to fifteen minutes in which black smoke may be expelled each hour. Dr. Councilman tells me that the new buildings of the Harvard Medical School do not suffer from smoke at all. In all those reports the important factor of the chimneys of private houses and open fireplaces, however, is not brought into consideration. Altogether, however, the common law declares the expulsion of smoke from chimneys to be a nuisance.

The public health act of 1875, section 91, subsection 7, which is valid for England with the exception of London and a few other cities that have local regulations of their own, demands, however, that the smoke of factories must be consumed as much as practicable by means of the ever improving technical discoveries and inventions, in the following words: "That such fireplace or furnace is constructed in such a manner as to consume as far as practicable (having regard to the nature of the manufacture or trade) all smoke arising therefrom, and that such fireplace or furnace has been carefully attended to by the person having the charge thereof."

The official work of the health boards has been aided by a number of coal smoke abatement societies in London and elsewhere, which employ their own watchers and inspectors alongside those employed by the government. It will not take very long before many manufacturers and engineers cease to object to the compulsory avoidance of smoke, on account of the acknowledged economic advantage due to a saving of coal.

That coal will be replaced by gas, which burns without smoke, appears more probable from year to year. Even we in America, who are notoriously slow in adopting sanitary measures, even theoretically, begin to replace coal by gas for domestic purposes. A cheap gas may be and has been manufactured in South Staffordshire and in Lon-

don, which, while not fit for illumination, is perfectly so for developing smokeless heat.

In a presidential address before a conference on smoke abatement, during 1906, Sir Oliver Lodge admonished his audience directly not to permit the combustion in cities of coal, but to insist instead on the regular preparation of cheap gas. I am afraid we in America have been too slow even to utilize natural gas as we should have done.

In a book on the influence of smoke on the respiratory organs (Stuttgart, 1905) Dr. Louis Ascher arrives at the following conclusions; Since 1875 acute inflammations of the respiratory organs have increased in Germany, England and America.[8] This increase was studied in a possible connection with the diminution of the power of resistance and with possible climatic or infectious causes. Neither of these factors could be charged with producing the increase of acute inflammatory respiratory ailments.

Carefully collected facts prove a higher mortality from these diseases both in towns and country, in the regions of the Rhine and in Silesia, where much smoke is produced. That is mainly so in the coal mines of the Ruhr river district in Westphalia. Here, where the air is always black, the mortality from inflammatory respiratory diseases among men is greater by 135 per cent. than among the Prussian males of equal age; of those so suffering the majority were those born in that region; the minority consisted of such as had come from distant country districts. Altogether it appears statistically certain that smoke causes a disposition for acute pulmonary diseases and accelerates the course of pulmonary tuberculosis.

It was also found that in a humid atmosphere coal dust was aspirated in larger quantities and in less time than in dry weather. Tubercular animals that were made to inhale moderate quantities of smoke through a period of ten hours died sooner than those which inhaled less of it. The question whether the inhalation of a moderate amount of smoke causes a disposition for acute respiratory inflammations had to be answered affirmatively, for inhalation of smoke followed by that of aspergillus accelerated

[8] Klebs: Amer. Med., vi, No. 24.

the causation of inflammation, when compared with the animals not so exposed to the fungus.

Further and final conclusions are as follows: The mortality from acute inflammatory pulmonary diseases is on the increase, mainly that of children and old people. The cause is to be sought for in the contamination of the atmosphere by smoke. In industrial districts the mortality of nurslings was six times larger than in agricultural communities. It was found that dense smoke districts had a larger mortality than other industrial centers, for instance, the textile industries. The mortality of coal miners surpasses that of the rest of the male population of 130 per cent.; the indigenous suffer more than the immigrant workmen. Animals infected with aspergillus without having been previously exposed to smoke inhalation did not contract pneumonia like those which were forced to inhale smoke.

Bartel and Neumann, in their work on experimental inhalation tuberculosis of the guinea-pig,[9] found that such guinea-pigs as had inhaled a moderate amount of smoke on account of their being kept in a large city died of pulmonary tuberculosis in less time than those which showed smoke-free lungs.

A serio-comic contrast is furnished by the opinions of those who assert that soot in the lungs prevents tuberculosis. On that theory the metal grinders of Sheffield had until twenty-five years ago the habit of going into places filled with coal dust after having been in metal dust all day. What was called "grinder's asthma" was and is tuberculosis. There were few that escaped. I understand the use of respirators is not common even today. If here and there little tuberculosis is found it is because very strong and healthy persons are preferred for that kind of work. But even M. Mendelsohn[10] met many persons dying of tuberculosis whose symptoms never showed themselves until they worked in coal dust and smoke.

By what road will smoke and coal dust get into the

[9] Wien. klin. Wochschr., 1906, Nos. 7 and 8.

[10] Traumatic phthisis, Berlin, 1885.

lungs? Its invasion may be either by inhalation or by the absorption from the intestinal tract and the lymph apparatus. Dr. Julius Arnold, professor of pathologic anatomy in Heidelberg, wrote a classical book in 1885 with the title: Researches on Dust Inhalation and Dust Metastasis. He admits the presence of carbon during his experiments, in the interior of the intestinal tract, but never in the wall of the tract or in the chyle vessels and mesenteric glands except in rare instances when a few stained cells only might be found in the tissue of the intestine and in the mesenteric glands. Villaret had suggested, in 1862, the probability of an intestinal origin of pulmonary anthracosis, but Arnold's results were too positive to be denied. It appears, however, that the frequent recent discussions in reference to the invasion of pulmonary tuberculosis, either by inhalation or by deglutition, tempted Vansteenberge and Grysez [11] to resume experiments relating to the same subject. They watched the progress of coloring matter introduced into the intestinal canal and the peritoneum. Contrary to what is known to be a fact, viz., that granular material circulating in the blood passes the lungs and is deposited in the liver, spleen, bone marrow and the lymph bodies, they asserted to have found that coloring material passed from the intestinal tract and the peritoneum through the lymph circulation into the lungs as a copious deposit. They met with this affirmative result preferably in adult animals, overlooking perhaps the fact that a certain degree of anthracosis is noticed in every animal that has passed its life in contaminated city air, but not in the very young, simply because the latter has not respired so long.

So Aschoff,[12] W. H. Schulze,[13] Mironesco,[14] M. Cohn [15] and finally a few weeks ago H. Beitzke [16] have demon-

[11] Intestinal Origin of Pulmonary Tuberculosis Ann. Pasteur, xii, 1905.

[12] Beitr. Z. Klinik der Tuberculose, Vol. 6.

[13] Münch. med. Wochschr., 1906, xxxv.

[14] Soc. Biolog., 61, No. 27.

[15] Perl. klin. Wochschr., 1906, No. 14.

[16] Virch. Arch., 1907, 187.

strated that Chinese ink, introduced into the abdominal cavity, is absorbed into the lymph ducts of the mesenteric lymph bodies and of the diaphragm, the sub- and supra-diaphragmatic glands, the thoracic duct, the vena mammaria interna and the blood. From here it enters the bone marrow, the spleen, the liver, but not the lungs. These experiments were very numerous and their results uniform. All of which proves that anthracosis of the lungs is directly caused by inhalation, and that smoke enters the lungs directly from the contaminated atmosphere, either through the mouth or through the nostrils, which exert their protecting influence to an insufficient extent only.

Meanwhile Section 96 of the Sanitary Code of the New York Health Department, in consequence of a decision "handed down" by Mr. Justice Dickey of the Supreme Court, has been emasculated so as to read:

"The owners, lessees, tenants, occupants and managers of every building, vessel and place in or on which a locomotive or stationary engine, furnace or boilers are used, shall cause all ashes, cinders, rubbish, dirt and refuse to be removed to some proper place, so that same shall not accumulate; nor shall any person cause, suffer or allow smoke, cinders, dust, gas, steam or offensive or noisome odors to escape or be discharged from any such building, vessel or place to the detriment or annoyance of any person or persons not being therein or thereon engaged."

No summary arrests of the evil doers are permitted. Civil actions for the penalty of $250 only are allowed, under Section 1262 of the Greater New York Charter; it takes a delay of one month in the issuing of an order to arrest a violator, during all of which time the nuisance continues and the public suffers; when the same is finally abated the public enemy suffers absolutely no penalty whatsoever and pays merely the few dollars costs of bringing the action to the corporation counsel.

As usual, the laws appear to be made to protect not the people but their enemies.

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